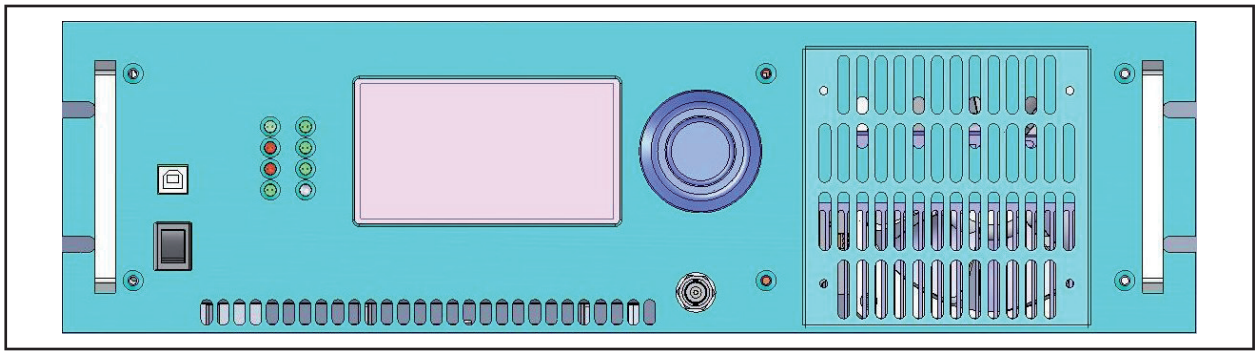
GOLD DIGITAL VIDEO

DVB-SH & DVB-H version

(mod. DTVP)



User Manual

Volume 1

Manufactured by R.V.R. TELEVISION **Italy**

File Name: 03_GOLD DIGITAL VIDEO_DTVP_DVBSH&H_ING_1.0.indd

Version: 1.0

Date: 11/06/2008

Revision History

Document History

Date	Version	Reason	Editor
11/06/2008	1.0	First Edition	E. Montagna

DTVP - User Manual
Version 1.0

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IMPORTANT

The lightning flash with arrowhead, within a triangle, is intended to alert the user of the presence of dangerous voltage that may constitute a risk of electric shock.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the equipment.

1. Preliminary Instructions

• General Warnings

This equipment should only be operated, installed and maintained by "trained" or "qualified" personnel who are familiar with risks involved in working on electric and electronic circuits. "Trained" means personnel who have technical knowledge of equipment operation and who are responsible for their own safety and that of other unqualified personnel placed under their supervision when working on the equipment.
"Qualified" means personnel who are trained in and experienced with equipment operation and who are responsible for their own safety and that of other unqualified personnel placed under their supervision when working on the equipment.

WARNING: Residual voltage may be present inside the equipment even when the ON/OFF switch is set to Off. Before servicing the equipment, disconnect the power cord or switch off the main power panel and make sure the safety earth connection is connected. Some service situations may require inspecting the equipment with live circuits. Only trained and qualified personnel may work on the equipment live and shall be assisted by a trained person who shall keep ready to disconnect power supply at need.

R.V.R. Television shall not be liable for injury to persons or damage to property resulting from improper use or operation by trained/untrained and qualified/unqualified persons.

WARNING: The equipment is not water resistant. Any water entering the enclosure might impair proper operation. To prevent the risk of electrical shock or fire, do not expose this equipment to rain, dripping or moisture.

Please observe local codes and fire prevention rules when installing and operating this equipment.

WARNING: This equipment contains exposed live parts involving an electrical shock hazard. Always disconnect power supply before removing any covers or other parts of the equipment.

Ventilation slits and holes are provided to ensure reliable operation and prevent overheating; do not obstruct or cover these slits. Do not obstruct the ventilation slits under any circumstances. The product must not be incorporated in a rack unless adequate ventilation is provided or the manufacturer's instructions are followed closely.

WARNING: This equipment can radiate radiofrequency energy and, if not installed in compliance with manual instructions and applicable regulations, may cause interference with radio communications.

WARNING: This equipment is fitted with earth connections both in the power cord and for the chassis. Make sure both are properly connected.

Operation of this equipment in a residential area may cause radio interference, in which case the user may be required to take adequate measures.

The specifications and data contained herein are provided for information only and are subject to changes without prior notice. **R.V.R. Television** disclaims all warranties, express or implied.While R.V.R. Television attempts to provide accurate information, it cannot accept responsibility or liability for any errors or inaccuracies in this manual, including the products and the software described herein. **R.V.R. Television** reserves the right to make changes to equipment design and/or specifications and to this manual at any time without prior notice.

• Notice concerning product intended purpose and use limitations.

This product is a radio transmitter suitable for frequency-modulation audio radio broadcasting. Its operating frequencies are not harmonised in designated user countries. Before operating this equipment, user must obtain a licence to use radio spectrum from the competent authority in the designated user country. Operating frequency, transmitter power and other characteristics of the transmission system are subject to restrictions as specified in the licence.

2. Warranty

La **R.V.R. Television** warrants this product to be free from defects in workmanship and its proper operation subject to the limitations set forth in the supplied Terms and Conditions. Please read the Terms and Conditions carefully, as purchase of the product or acceptance of the order acknowledgement imply acceptance of the Terms and Conditions. For the latest updated terms and conditions, please visit our web site at WWW.RVR.IT. The web site may be modified, removed or updated for any reason whatsoever without prior notice. The warranty will become null and void in the event the product enclosure is opened, the product is physically damaged, is repaired by unauthorised persons or is used for purposes other than its intended use, as well as in the event of improper use, unauthorised changes or neglect.
In the event a defect is found, follow this procedure:

1 Contact the seller or distributor who sold the equipment; provide a description of the problem or malfunction for the event a quick fix is available.

Sellers and Distributors can provide the necessary information to troubleshoot the most frequently encountered problems. Normally, Sellers and Distributors can offer a faster repair service than the Manufacturer would. Please note that Sellers can pinpoint problems due to wrong installation.

2 If your Seller cannot help you, contact **R.V.R. Television** and describe the problem; if our staff deems it appropriate, you will receive an authorisation to return the equipment along with suitable instructions;

3 When you have received the authorisation, you may return the unit. Pack the unit carefully before shipment; use the original packaging whenever possible and seal the package perfectly. The customer bears all risks of loss (i.e., R.V.R. shall not be liable for loss or damage) until the package reaches the R.V.R. factory. For this reason, we recommend insuring the goods for their full value. Returns must be sent on a C.I.F. basis (PREPAID) to the address stated on the authorisation as specified by the R.V.R. Service Manager.

Units returned without a return authorisation may be rejected and sent back to the sender.

4 Be sure to include a detailed report mentioning all problems you have found and copy of your original invoice (to show when the warranty period began) with the shipment.

Please send spare and warranty replacement parts orders to the address provided below. Make sure to specify equipment model and serial number, as well as part description and quantity.

R.V.R. Television
Via del Fonditore, 2/2c
40138 BOLOGNA ITALY
Tel. +39 051 6010506

3. First Aid

All personnel engaged in equipment installation, operation and maintenance must be familiar with first aid procedures and routines.

3.1 Electric shock treatment

3.1.1 If the victim is unconscious

Follow the first aid procedures outlined below.

- Lay the victim down on his/her back on a firm surface.
- the neck and tilt the head backwards to free the airway system (**Figure 1**).

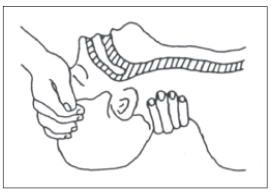


Figure 1

- If needed, open the victim's mouth and check for breathing.
- If there is no breathing, start artificial respiration without delay (**Figure 2**) as follows: tilt the head backwards, pinch the nostrils, seal your mouth around the victim's mouth and give four fast rescue breaths.

Figure 2

- Check for heartbeat (**Figure 3**); if there is no heartbeat, begin chest compressions immediately (**Figure 4**) placing your hands in the centre of the victim's chest (**Figure 5**).

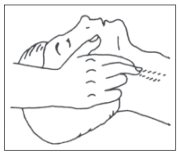


Figure 3

Figure 4

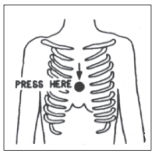


Figure 5

- One rescuer: give 2 quick rescue breaths after each 15 compressions.
- Two rescuers: one rescue breath after each 5 compressions.
- Do not stop chest compressions while giving artificial breathing.
- Call for medical help as soon as possible.

3.1.2 If the victim is conscious

- Cover victim with a blanket.
- Try to reassure the victim.
- Loosen the victim's clothing and have him/her lie down.
- Call for medical help as soon as possible.

3.2 Treatment of electric burns

3.2.1 Large burns and broken skin

- Cover affected area with a clean cloth or linen.
- Do not break any blisters that have formed; remove any clothing or fabric that is stuck to the skin; apply adequate ointment.
- Administer adequate treatment for the type of accident.
- Get the victim to a hospital as quickly as possible.
- Elevate arms and legs if injured.

If medical help is not available within an hour, the victim is conscious and is not retching, administer a solution of table salt and baking soda (one teaspoon of table salt to half teaspoon of baking soda every 250 ml of water).

Have the victim slowly drink half a glass of solution for four times during a period of 15 minutes.

Stop at the first sign of retching.

Do not administer alcoholic beverages.

3.2.2 Minor burns

- Apply cold (not ice cold) strips of gauze or dress wound with clean cloth.
- Do not break any blisters that have formed; remove any clothing or fabric that is stuck to the skin; apply adequate ointment.
- If needed, have the victim change into clean, dry clothing.
- Administer adequate treatment for the type of accident.
- Get the victim to a hospital as quickly as possible.
- Elevate arms and legs if injured.

4. Unpacking

The package contains:

- 1 **DTVP (alias Gold Digital Video)**
- 1 User Manual
- 1 Mains power cable

The following accessories are also available from Your R.V.R. Dealer:

- **Accessories, spare parts and cables**

4.1. General Description

4.1.1 Introduction

The DTVP modulator can be configured as DVB-T, DVB-H, DVB-SH or ATSC-8VSB. To order please specify the model type. All versions are equipped with precorrector.

The DTVP is a modulator, there is no need to calibrate filters or other parts in order to change channel.

4.1.2 Main features

- DVB-T, DVB-H, DVB-SH, ATSC-8VSB, FULL COMPLIANT
- UHF AGILY
- ASI1 AND ASI2 DIGITAL INPUT
- ASI1 LP AND AS2 LP DIGITAL INPUT
- SMPTE-310M/TS DIGITAL INPUT
- GPS (optional)
- DIGITAL PRECORRECTION
- DIGITAL NON LINEAR PRECORRECTION
- MER 36 dB MINIMUM
- RF SOFT START
- RVR STANDARD TELEMETRY
- 19”, 3 UNIT RACK
- POWER SUPPLY 90-270VAC 60/50Hz

4.1.3 Components

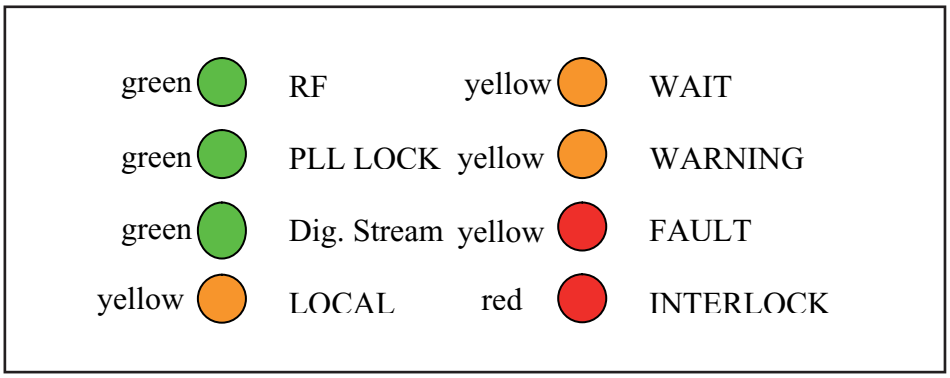
- Power supply
- Professional Digital modulator
- CPU/DISPLAY

- Signal interface and protection
- Directional coupler
- RF driver
- RF amplifier
- Blower

4.1.4 Front and rear panel

The front panel contains the following indications and connectors:

- BNC connector for RF MONITOR
- Switch
- LCD display
- Status indicator LED



The rear panel contains the following connectors

- AC mains input & ON/OFF switch
- SMA for digital stream input: ASI1, ASI1 LP, ASI2, ASI2 LP, SMPTE
- SMA reference for 10MHz and PPS
- DB25 telemetry
- DB9 for RS232 (service)
- RJ45 for RS485 (optional)
- BNC for interlock
- N for RF OUTPUT
- Ground reference

5. Quick guide for installation and use

This section provides a step-by-step description of the machine installation and configuration procedure. Follow these procedures closely upon first power-on and each time any change is made to general configuration, such as when a new transmission station is added or the amplifier is replaced.

Once the desired configuration has been set up, no more settings are required for normal operation; at each power-up (even after an accidental shutdown), the amplifier defaults to the parameters set during the initial configuration procedure.

The topics covered in this section are discussed at greater length in the next sections, with detailed descriptions of all hardware and firmware features and capabilities. Please see the relevant sections for additional details.

☞ ***IMPORTANT:*** *When configuring and testing the transmitter in which the exciter is integrated, be sure to have the Final Test Table supplied with the machine ready at hand throughout the whole procedure; the Final Test Table lists all operating parameters as set and tested at the factory.*

5.1 Preparation

5.1.1 Preliminary checks

Unpack the amplifier and immediately inspect it for transport damage. Ensure that all connectors are in perfect condition.

Provide for the following (applicable to operating tests and putting into service):

√ Single-phase 230 VAC (-15% / +10%), or 115 VAC through internal connector, mains power supply with adequate ground connection

√ For operating tests only: dummy load with 50 Ohm impedance and adequate capacity

√ Connection cable kit including:

- Mains power cable

5.1.2 Connections

The main fuse can be accessed from the outside, on the rear panel. Extract the fuse holder using a screwdriver and make sure that it is intact; replace it if necessary.

Connect a suitable dummy load with suitable dissipation power, or antenna, or the input of final amplifier to the RF output (see figure 9.2 - item [2]) using a 50-Ohm coaxial cable with “N”-type connectors.

☞ ***Note:*** *When you connect the **DTVP** to other devices, it is necessary to strictly follow the instructions given by the resepective manufacturers, to avoid damages or danger situations.*

WARNING: Electric shock hazard. Never handle the RF output connector when the machine is powered on and no load is connected. Injury or death may result.

Ensure that the **POWER** switch on the front panel (see figure 9.1 - item [3]), and the switch on the rear panel are set to (see figure 9.2 - item [13]) "**OFF**".

Connect the mains power cable to the MAINS terminal board on the rear panel (see figure 9.2 - item [15]).

Note : *The mains must be equipped with adequate ground connection properly connected to the machine. This is a pre-requisite for ensuring operator safety and correct operation.*

Connect the cable with an ASI signal to the relevant connector (ASI1 or ASI2) on the back of the machine using a 75-Ohm coaxial cable with SMA connectors. Connect also the GPS antenna when expected.

5.2 First power-on and setup

Follow this procedure upon first power-on and after making changes to the configuration of the transmitter in which the amplifier is integrated.

Note : *Standard factory settings are RF power output Off (**Pwr OFF**) and output power set to upper limit (unless otherwise specified by customer).*

5.2.1 Power-on

Question:
The equipment is turn off?

Answer:
• When you have performed all of the connections described in the previous paragraph, power on the amplifier using the suitable power switch on the rear panel (figure 9.2 - item [13]). Power on the pilot exciter switch on the front panel (figure 9.1 - item [7]).
Ensure that the **ON** light turns on (see figure 9.1 - item [2]). Start up informations should appear briefly on the display, quickly followed by the main readings. If RF output is disabled, these readings will be zero.

5.2.2 Frequency lock check

Question:
The equipment doesn't work correctly?

Answer:
• Ensure that the **LOCK** light turns on (see figure 9.1 - item [2]). It indicates the PLL is locked to working frequency, wait at least 15 seconds from the power on of **DTVP**.

5.2.3 Power check

Question:
The equipment doesn't work correctly at the power set up?

Answer:
• Ensure that the **INTERLOCK** light turns off (see figure 9.1 - item [2]). It indicates that no external interlock signal inhibites the delivering power from exciter.

• Ensure that the **ASI Inputs** are performed by 75 Ohm cables with SMA connectors.

• Check current **RF** output setting and enable output (if not already enabled) following menu path **Submenu selection** ⇒ **P.A.** ⇒ **Setting RF** (chap. 6.2.4).
Output power can also be set in a Pwr OFF condition; in this condition, (Fwd) output power reading on the display will be 0 (zero), that will be delivered the moment you switch back to Pwr ON state.

• Check output power level and set to maximum level (if not already set to maximum) from the Power Setup Menu, which you can call up by pressing these keys in the order: **Submenu selection** ⇒ **P.A.** ⇒ **Power Output** (chap. 6.2.4).

Use **Power Amplifier set** menu to set the desired amplifier output power, whereas the forward power value shown on the display (**Forward: xxx.x W**) gives actual output power reading.

5.2.4 Changing the Power Good alarm threshold

Change Forward Power Good alarm setting **PgFWD** from the **Submenu selection** ⇒ **GEN.** ⇒ **PgSet** menu as required (factory setting is 50%).

Please read section 6.2.12 for more details.

5.2.5 How to enable Local mode

Question:
The equipment don't accept command through Control knob?

Answer:

• Check current mode setting and enable **Local mode** (if not already enabled) following menu path **Submenu selection** ⇒ **GEN.** ⇒ **Status** ⇒ **Local** (chap. 6.2.12): if left disabled, the machine will not accept the next commands.

5.2.6 How to enable Remote mode

If you wish to use the telemetry control feature, enable Remote control in the **Submenu selection** ⇒ **GEN.** ⇒ **Status** ⇒ **Remote** menu (see section 6.2.12 for details).

Note : *In the **Remote** mode the control knob, except **Remote/Local** (for switching back to Local mode), are disabled. Operating parameter readings are available.*

6. Operating System

The exciter is controlled by a microprocessor system. Software operations may be grouped into two broad categories: start-up and normal operation.

6.1 Using the encoder

The interaction between the user and the exciter's control software is performed using the encoder.

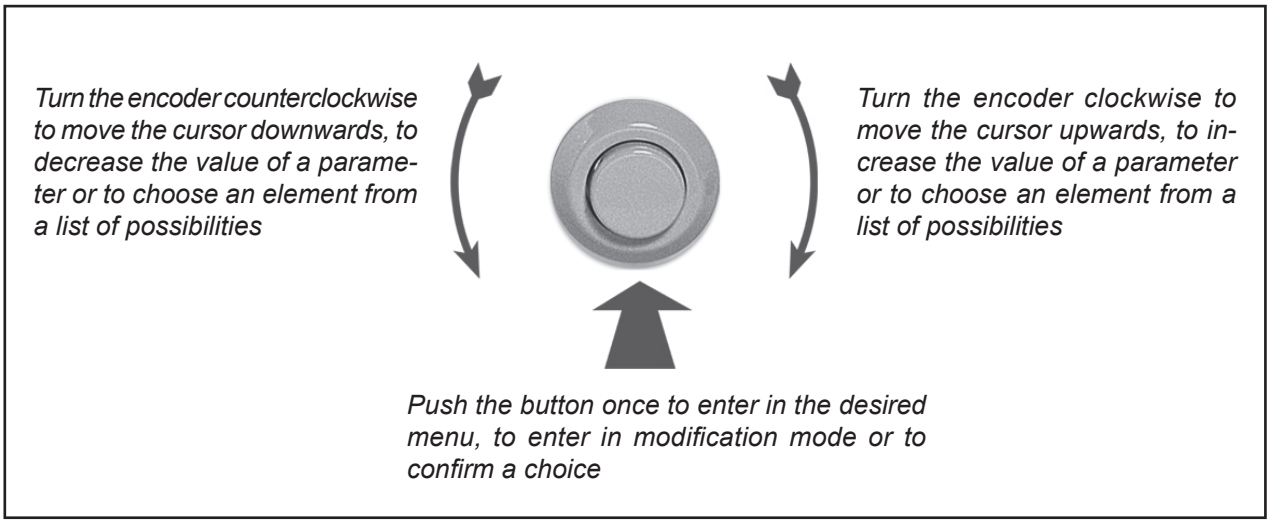

Turn the encoder counterclockwise to move the cursor downwards, to decrease the value of a parameter or to choose an element from a list of possibilities
Turn the encoder clockwise to move the cursor upwards, to increase the value of a parameter or to choose an element from a list of possibilities
Push the button once to enter in the desired menu, to enter in modification mode or to confirm a choice

Figure 6.1

The possible operations that you can carry out on the encoder are:

- **rotation**: moves the cursor shown on the display; if you turn the encoder to the left (counterclockwise), the cursor moves downwards, if you turn it right the cursor moves upwards; it also permits to increase or diminish the parameters (turning the encoder left diminishes the parameter, turning it right increases it) or to select an item from a list of options.
  The rotation of encoder causes the lighting of the display, in case it is not been lighted.
- **pushing**: push the button once when the cursor is on the name of a menu to enter in that menu, push it when the corsor is on the name of a parameter to enter in modification mode (the cursor starts blinking); after the modification of a parameter, push the button to save the new value.
  The pushing of encoder causes the lighting of the display, in case it is not been lighted.

After having modified the value of a parameter, the cursor goes on blinking for approximately 10 seconds, waiting for confirmation from the user. If the user doesn't confirm the new value (i.e., the button is not pressed), the cursor stops blinking and remains on the selected parameter.

If no controls are operated during 2 minutes, the exciter returns to the default menu, and after 5 minutes of inactivity the display lighting will be turning off.

6.2 DVB-SH & H Software

6.2.1 Start-up

Upon switch-on, a window that holds the RVR logo and machine informations appears on the display. The informations regards the firmware release and the programming table.

Note: during the start-up operation don't press or turn the encoder. To reset the factory parameters, change between SH and H mode read chap 6.2.1.1. To update the firmware, please read the Appendix A.

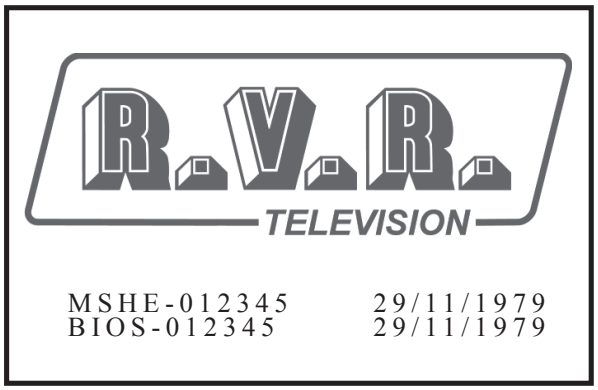


Figure 6.1- Example of start-up screen

Otherwise, in substitution of the RVR logo, are available informations regarding equipment personalization, arranged on four rows of 16 characters.

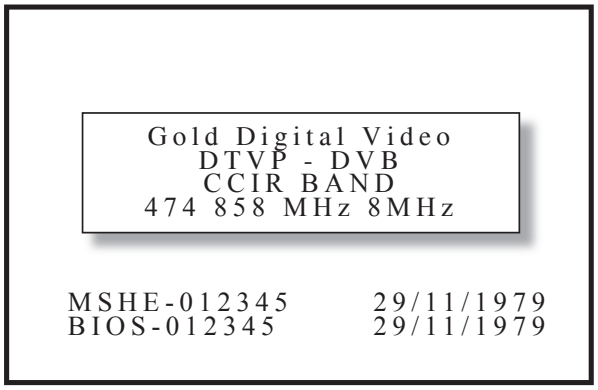


Figure 6.2 - Example of personalization screen

After approximately 10 seconds this screen is replaced with the default screen (see chap. 6.2.2).

6.2.1.1 Reset through encoder at Start-up

Holding press the encoder button during switch-on, an alternative main window appears on the display.

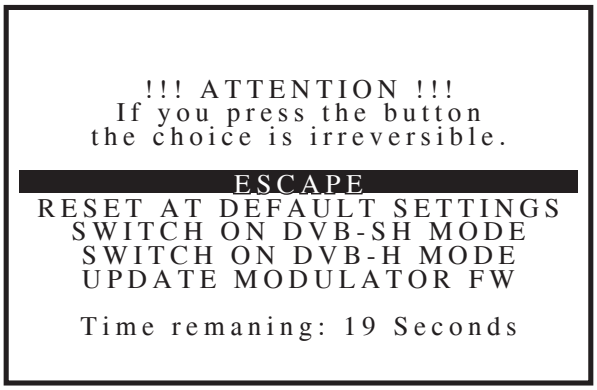


Figure 6.3

The informations regards:

- **Escape**: press this selection to return to normal start-up menu (see chap. 6.2.1)
- **Reset at default settings**: press this selection in case you want to restore the default factory settings. During the operation of restore you see a screen like this:

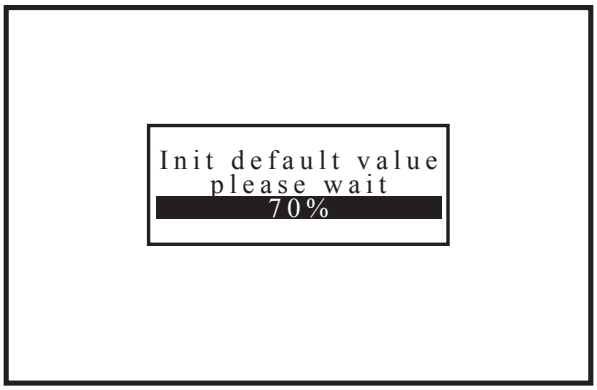


Figure 6.4

- **Switch on DVB-SH mode**: press this selection in case you want to switching from **DVB-H** mode to **DVB-SH** mode.
- **Switch on DVB-H mode**: press this selection in case you want to switching from **DVB-SH** mode to **DVB-H** mode.
- **Update Modulator FW**: press this selection in case you want to upgrade the firmware of the equipment. During the operation of restore you see a screen like this:

Figure 6.5

Note: For more information about the firmware upgrade like predisposition, connections or times for the upgrade operation, please read the Appendix A.

6.2.2 Default menu

This is an information screen; it shows the main measures.

If the illumination of the display is turned off, the first pressure or rotation of the encoder cause the lighting.

To access to the Selection submenus press the encoder, turn until the indicator is highlighted on the desired menu and then press again to confirm.

If no controls are operated through the encoder during 2 minutes, the exciter returns to this menu and after 5 minutes of inactivity the display lighting will be turning off.

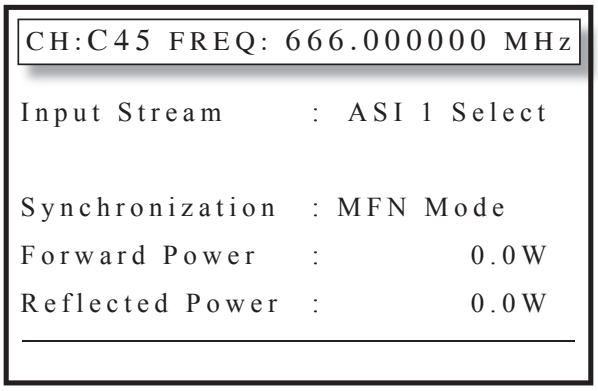


Figure 6.6

`CH` Visualization of the channel in transmission

`Freq` Visualization of the channel frequency with offset

`Input Stream`
Visualization of the input selected (ASI1/ASI2)

`Synchronization`
Visualization of the synchronism mode selected (SFN/MFN)

`Forward Power`
Visualization of the forward power expressed in Watt or mWatt

`Reflected Power`
Visualization of the reflected power expressed in Watt or mWatt

6.2.3 Submenu selection

Under this menu is possible enter inside to several submenu. Turning the encoder, you can move the cursor to the next submenu label, the name is displayed in the lower part of the screen.

To return to the default menu (see chap. 6.2.2), rotate the encoder until the “EXIT” label is highlighted, then press to exit the Menu screen.
In alternative you can avoid to use the encoder for about 2 minutes to return to the default menu (see chap. 6.2.2) automatically.

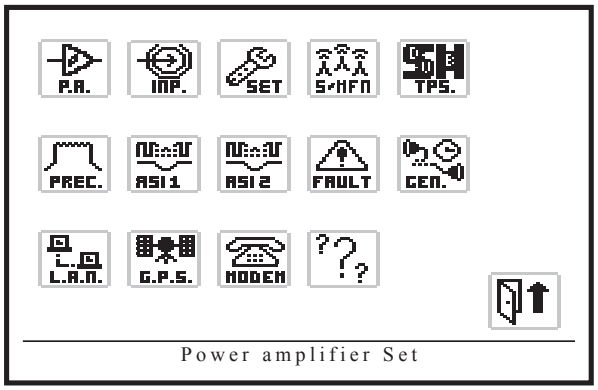


Figure 6.7 - Submenu selection for DVB-SH mode

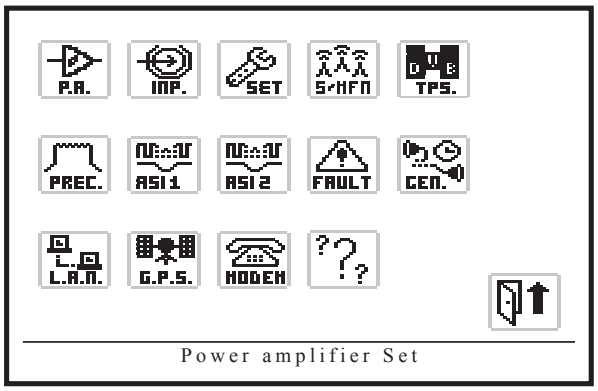


Figure 6.8 - Submenu selection for DVB-H mode

MENU	SH mode (fig.8.4)	H mode (fig.8.5)
P.A.	Power Amplifier set	Power Amplifier set
INP.	Input settings	Input settings
SET	Modulation settings	Modulation settings
S/MFN	Synchronization set	Synchronization set
TPS.	DVB-SH TPS Settings	DVB-H TPS Settings
PREC.	Precorrector Settings	Precorrector Settings
ASI 1	ASI Selected Stream Status	ASI1 Stream Status
ASI 2	Not Used	ASI2 Stream Status
FAULT	Alarm Set and Status	Alarm Set and Status
GEN.	General Settings	General Settings
L.A.N.	TCP/IP Option set	TCP/IP Option set
G.P.S.	GPS Option Status	GPS Option Status
MODEM	Modem Informations	Modem Informations
???	Informations	Informations
↑	Exit (press to return to main menu)	Exit (press to return to main menu)

6.2.4 Power Amplifier set

This menu provides the Power Amplifier setting of the exciter.

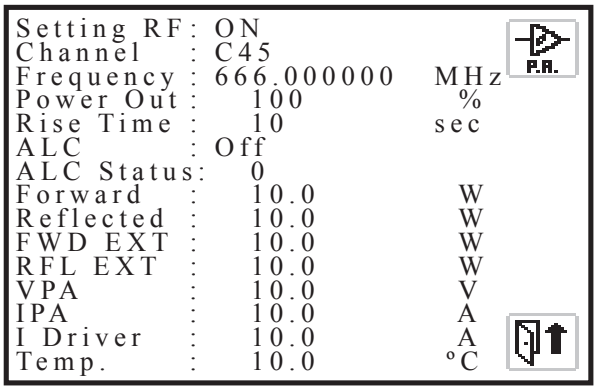


Figure 6.9

`Setting RF` Selection of the equipment power status. The status can be set ON (RF power output enabled) or OFF (RF power output disabled).

`Channel` Selection of the working channel, depends on table.

`Frequency` Selection of the frequency offset. The adjustment of the level is available in ±200 KHz.

`Power Output` Selection of the output power percentage desired from 0 (output power disabled) to 105 %.

`Rise Time` Selection of the length of time regarding the power ascent ramp. The adjustment of the level is available from 10 to 60 seconds.

`ALC` Selection of Automatic Level Control status. The status can be set ON (ALC enabled) or OFF (ALC disabled).

`ALC Status` Visualization of Automatic Level Control status. The visualization of the level is available in ±127 steps.

`Forward` Visualization of the forward power expressed in Watt (for powers over 3W) or mWatt (for powers under 3W).

`Reflected` Visualization of the reflected power expressed in Watt (for powers over 3W) or mWatt (for powers under 3W).

`FWD EXT` Visualization of the external forward power expressed in Watt.

`RFL EXT` Visualization of the external reflected power expressed in Watt.

`VPA` Visualization of the feeding voltage of power amplifier expressed in Volt.

`I Driver` Visualization of the absorbed current from driver expressed in Ampere.

`Temp` Visualization of the amplifier module temperature expressed in degrees centigrade.

`Exit` Press to return on submenu selection.

6.2.5 Input settings

This menu provides the setting on inputs of the exciter.

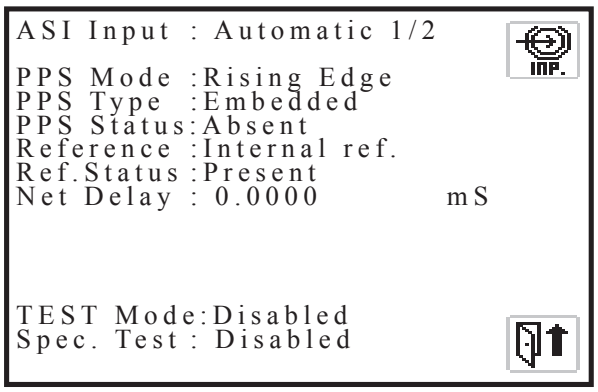


Figure 6.10

`ASI Input` Selection of the ASI channel input (Automatic or ASI1 or ASI2)

`PPS Mode` Selection of the PPS front mode (Rising or Falling)

`PPS Type` Selection of the PPS input type (Internal or External or Embedded)

`PPS Status` Visualization of the PPS status (Present or Absent)

`Reference` Selection of the 10MHz Input (Internal or External/ASI)

`Ref.Status` Visualization of the 10MHz status (Present or Absent)

`Net Delay` Visualization of the network delay about ASI input expressed in mS.

`TEST Mode` Selection of the stream generator of test mode

`Spec. test` Selection of the stream generator of special test mode

`Exit` Press to return on submenu selection.

6.2.6 Modulation settings

This menu provides the setting on modulations of the exciter.

6.2.6.1 Modulation settings for DVB-SH

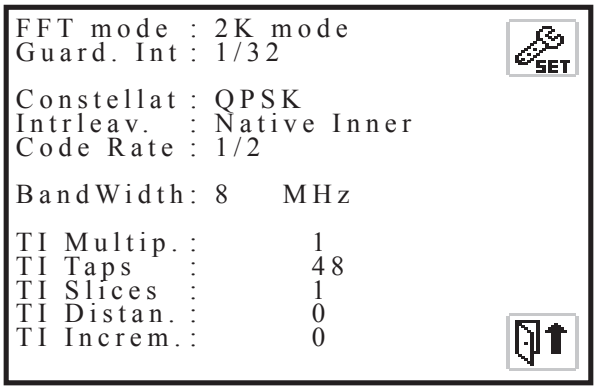


Figure 6.11

`FFT Mode` Selection of the FFT mode (2K or 8K or 4K or 1K)

`Guard int.` Selection of the guard interval (1/32 or 1/16 or 1/8 or 1/4)

`Constellat` Selection of the constellation type (QSPK or 16QAM)

`Interleav` Selection of the interleaver inner mode (Native or In-depth)

`Code Rate` Selection of the code rate (1/5 or 2/9 or ... 2/3 complementary)

`TI Multip` Selection of the TI multiplier (from 0 to 63)

`TI Taps` Selection of the TI Nof Late Taps (from 0 to 48)

`TI Slices` Selection of the TI Nof Slices (from 1 to 48)

`TI Distan.` Selection of the TI Slice Distane (from 0 to 255)

`TI Increm.` Selection of the TI Non Late Increment (from 0 to 63)

`Exit` Press to return on submenu selection.

6.2.6.2 Modulation settings for DVB-H

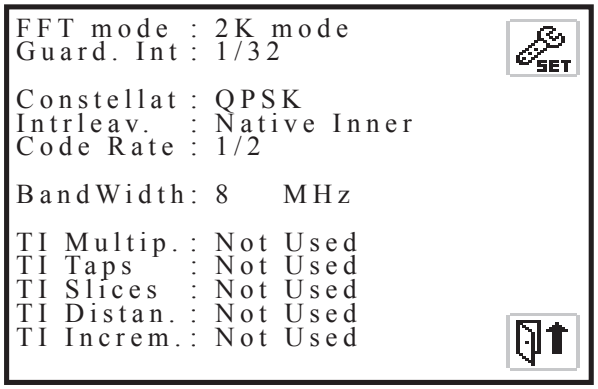


Figure 6.12

FFT Mode	Selection of the FFT mode (2K or 8K or 4K)
Guard int.	Selection of the guard interval (1/32 or 1/16 or 1/8 or 1/4)
Constellat	Selection of the constellation type (QSPK or 16QAM or 64QAM)
Interleav	Selection of the interleaver inner mode (Native or In-depth)
Code Rate	Selection of the code rate (1/2 or 2/3 or 3/4 or 5/6 or 7/8)
TI Multip	Not Used
TI Taps	Not Used
TI Slices	Not Used
TI Distan.	Not Used
TI Increm.	Not Used
Exit	Press to return on submenu selection.

6.2.7 Synchronizations settings

This menu provides the setting on Single and Multi Frequency Network of the exciter.

6.2.7.1 Synchronizations settings for DVB-SH

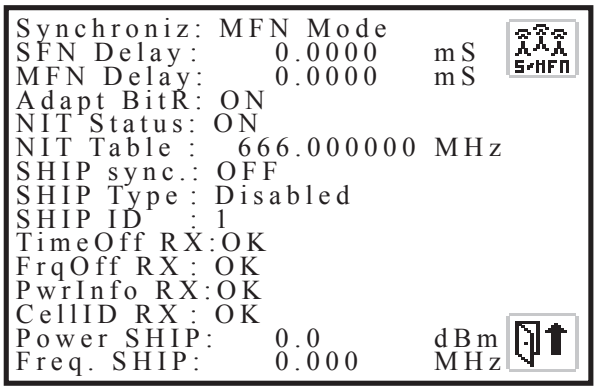


Figure 6.13

`Synchroniz` Selection of the synchronization mode (MFN or SFN)

`SFN Delay` Selection of the SFN delay

`MFN Delay` Selection of the MFN delay

`Adapt BitR` Selection of the bitrate adaptation (On or OFF)

`NIT Status` Selection of the Nit table status (On or OFF)

`NIT table` Selection of the Nit table expressed in MHz

`SHIP Sync.` Selection of the SHIP synchronization (On or OFF)

`SHIP Type` Selection of the SHIP synchronization mode (Disabled or Enabled)

`SHIP ID` Selection of the SHIP Identifier

`TimeOff RX` Visualization of the Time Offset reception status

`FrqOff RX` Visualization of the Frequency Offset reception status

`PwrInfo RX` Visualization of the Power Offset reception status

`Power SHIP` Visualization of the Frequency offset value

`Freq. SHIP` Visualization of the Frequency offset value

`Exit` Press to return on submenu selection.

6.2.7.2 Synchronizations settings for DVB-H

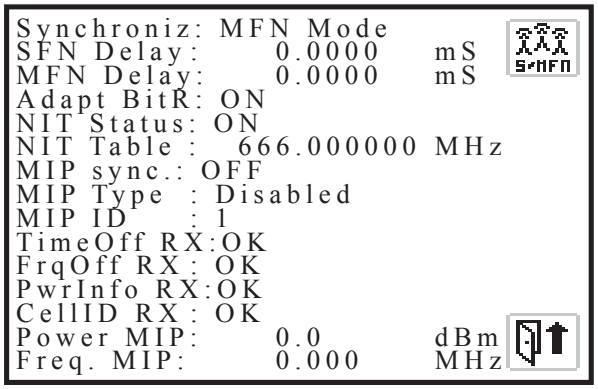


Figure 6.14

`Synchroniz` Selection of the synchronization mode (MFN or SFN)

`SFN Delay` Selection of the SFN delay

`MFN Delay` Selection of the MFN delay

`Adapt BitR` Selection of the bitrate adaptation (On or OFF)

`NIT Status` Selection of the Nit table status (On or OFF)

`NIT table` Selection of the Nit table expressed in MHz

`MIP Sync.` Selection of the MIP synchronization (On or OFF)

`MIP Type` Selection of the MIP synchronization mode (Disabled or Enabled)

`MIP ID` Selection of the MIP Identifier

`TimeOff RX` Visualization of the Time Offset reception status

`FrqOff RX` Visualization of the Frequency Offset reception status

`PwrInfo RX` Visualization of the Power Offset reception status

`Power MIP` Visualization of the Frequency offset value

`Freq. MIP` Visualization of the Frequency offset value

`Exit` Press to return on submenu selection.

6.2.8 DVB TPS settings

This menu provides the setting on Additional TPS of the exciter.

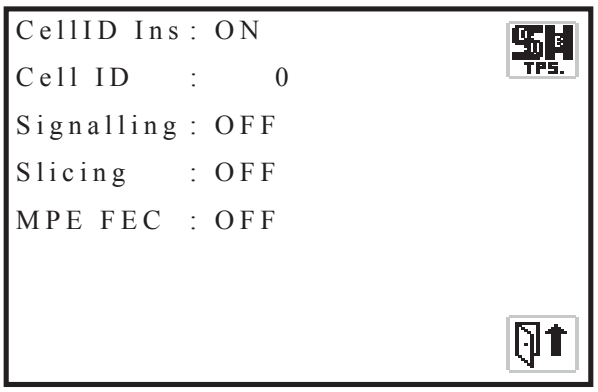


Figure 6.15 - DVB TPS settings for DVB-SH mode

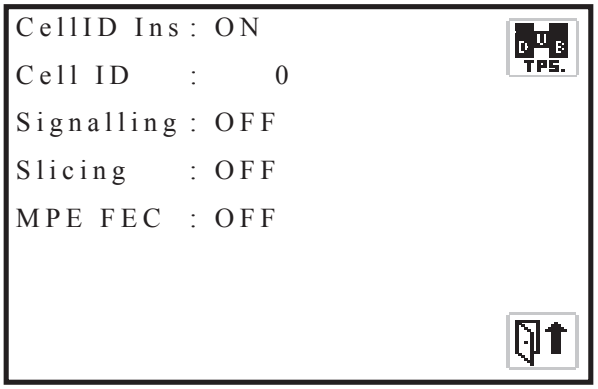


Figure 6.16 - DVB TPS settings for DVB-H mode

`CellID Ins` Selection of the Cell ID insertion mode (On or Off)

`Cell ID` Selection of the Cell ID

`Signalling` Selection of the signalling mode (On or Off)

`Slicing` Selection of the slicing mode (On or Off)

`MPE FEC` Selection of the MPE FEC mode (On or Off)

`Exit` Press to return on submenu selection.

6.2.9 Precorrectors settings

This menu provides the setting on linear and non-linear precorrection of the exciter.

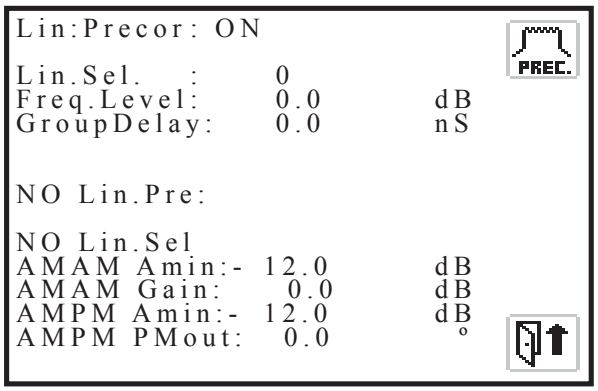


Figure 6.17

`Lin.Precor` Selection of the linear precorrection mode (On or Off)

`Lin.Sel.` Selection of the point for visualization.

`Freq.level` Visualization of the level of selected point expressed in dB.

`GroupDelay` Visualization of the delay of selected point expressed in nS.

`NO Lin.Pre` Selection of the non-linear precorrection mode (On or Off)

`AMAM Amin` Visualization of the level of selected point expressed in dB.

`AMAM Gain` Visualization of the gain of selected point expressed in dB.

`AMPM Amin` Visualization of the level of selected point expressed in dB.

`AMPM PMout` Visualization of the phase of selected point expressed in degrees.

`Exit` Press to return on submenu selection.

6.2.10 ASI1 & ASI2 stream status

This menus provides the visualization on ASI1 (see fig. 6.15) and ASI2 (see fig.6.16) inputs status of the exciter.

6.2.10.1 ASI1 & ASI2 stream status for DVB-SH

Note: in this case ASI2 menù is not accessible. The measures displayed regards the the ASI channel input selected in Input Settings Menu (see chap 6.2.5).

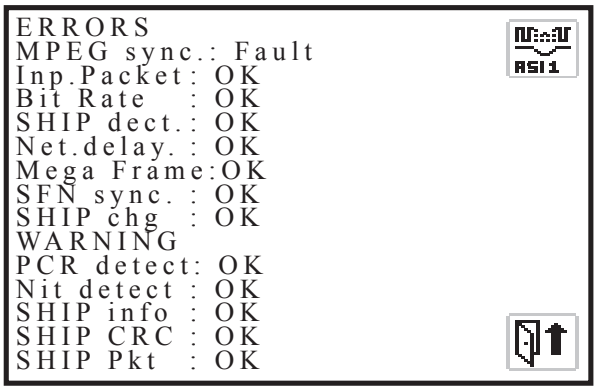


Figure 6.18

`MPEG Sync` Visualization of the MPEG-TS synchronization

`Inp.Packet` Visualization of input packet status.

`Bit Rate` Visualization of the bitrate overflow.

`SHIP dect.` Visualization of the SHIP received.

`Net.Delay` Visualization of the overflow network delay status.

`Mega Frame` Visualization of the mega frame error status.

`SFN sync.` Visualization of the SFN synchrnonism.

`SHIP chg.` Visualization of the SHIP parameters change.

`PCR detect` Visualization of the PCR receivede.

`Nit detect` Visualization of the NIT receivede.

`SHIP INFO` Visualization of the info about SHIP.

`SHIP CRC` Visualization of the CRC about SHIP.

`SHIP Pkt` Visualization of the absence status about SHIP packets

`Exit` Press to return on submenu selection.

6.2.10.2 ASI1 & ASI2 stream status for DVB-H

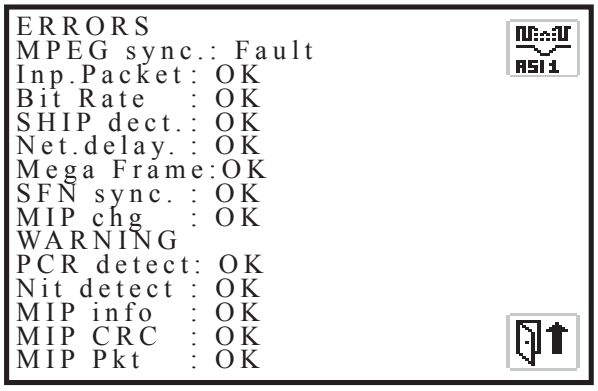


Figure 6.19

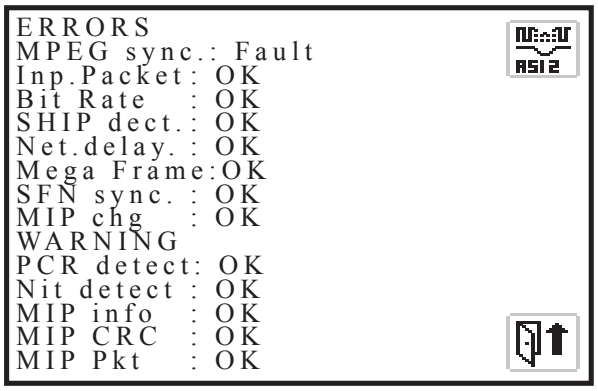


Figure 6.20

`MPEG Sync` Visualization of the MPEG-TS synchronization

`Inp.Packet` Visualization of input packet status.

`Bit Rate` Visualization of the bitrate overflow.

`SHIP dect.` Visualization of the SHIP received.

`Net.Delay` Visualization of the overflow network delay status.

`Mega Frame` Visualization of the mega frame error status.

`SFN sync.` Visualization of the SFN synchrnonism.

`MIP chg.` Visualization of the MIP parameters change.

`PCR detect` Visualization of the PCR receivede.

`Nit detect` Visualization of the NIT receivede.

`MIP INFO` Visualization of the info about MIP.

`MIP CRC` Visualization of the CRC about MIP.

`MIP Pkt` Visualization of the absence status about MIP packets

`Exit` Press to return on submenu selection.

6.2.11 Alarm set and status

This menu provides the setting on alarm conditions for the exciter.

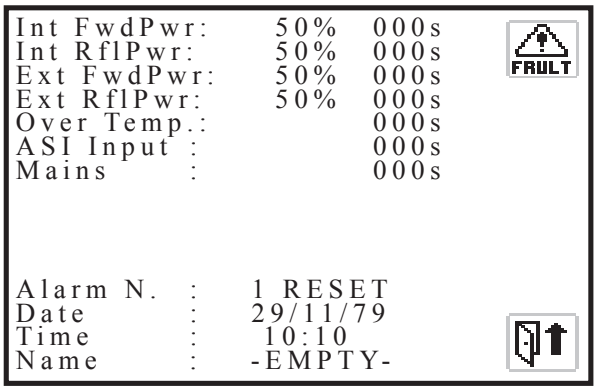


Figure 6.18

`Int FwdPwr` Selection of the alarm activation level in case of equipment forward power lack expressed in percentage. The adjustment of the level is available in step of 1 % from 0 (alarm disabled) to 99 %.

`Int RflPwr` Selection of the alarm activation level in case of equipment reflected power lack expressed in percentage. The adjustment of the level is available in step of 1 % from 0 (alarm disabled) to 99 %.

`Ext FwdPwr` Selection of the alarm activation level in case of system forward power lack expressed in percentage. The adjustment of the level is available in step of 1 % from 0 (alarm disabled) to 99 %.

`Ext RflPwr` Selection of the alarm activation level in case of system reflected power lack expressed in percentage. The adjustment of the level is available in step of 1 % from 0 (alarm disabled) to 99 %.

`Over Temp.` Selection of the alarm time for overtemperature of equipment, expressed in seconds.

`ASI Input` Selection of the alarm time for overtemperature of equipment, expressed in seconds.

`ASI Input` Selection of the alarm time for mains absence of equipment, expressed in seconds.

`Mains` Selection of the alarm time for mains absence of equipment, expressed in seconds.

`Alarm N.` Selection of the alarm stored to be displayed expressed in seconds.

`Date` Visualization of the date about the alarm choosen.

`Time` Visualization of the time about the alarm choosen.

`Name` Visualization of the name about the alarm choosen.

s	Selection of the alarm activation time, referred to the several entries, expressed in seconds. The adjustment of the value is available in step of 1 s from 0 to 240 s.
Exit	Press to return on submenu selection.

In the following is shown the operating logic of an alarm:

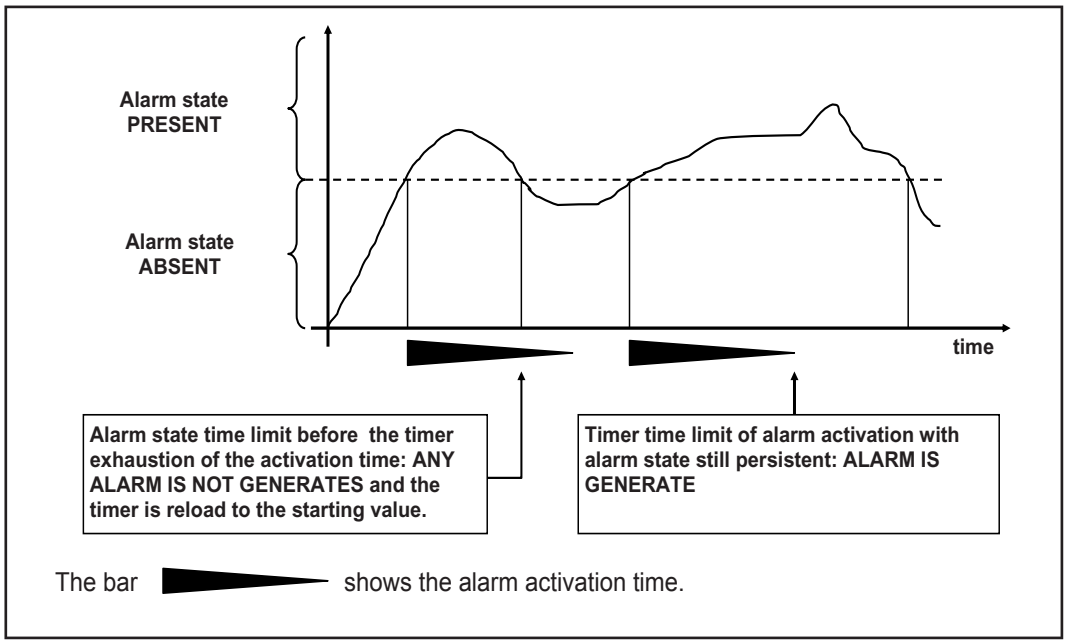

Alarm state
PRESENT
Alarm state
ABSENT
time
Alarm state time limit before the timer exhaustion of the activation time: ANY ALARM IS NOT GENERATES and the timer is reload to the starting value.
Timer time limit of alarm activation with alarm state still persistent: ALARM IS GENERATE
The bar
shows the alarm activation time.

Figure 6.19

After the start-up procedure wait for about 5 minutes before to control the alarms state; also after change from OFF to ON condition wait the same time.

The activation times are adjustable (if the time is set to 0, the alarm is not considerated) whereas the restore happen in case of tha alarm condition is not confirmed for 10 seconds.

Alarm conditions are numbered from 1 to 10 and reflect the following situations: forward output power (internal/external) too high, reflected output power (internal/external) too high, ASI input power absence, overtemperature or mains fault.

6.2.11.1 Alert Management

Alarm monitoring cycle is as follows: after the inital wait of about 60 Seconds are management the following Conditions:

WAIT Condition:

This condition temporarily inhibit the ouput power of transmitter and are signalled through the **WAIT led** turns on (see fig. 9.1 - item [2]), through Graphic User Interface, through TC/TS (see chap. 9.3.2) and TELECON.

Alarm counter increases by 1 unit, machine goes into lock-out state and the display shows the cause for the stop. After the times described below, the machine attempts to re-start; if a new alarm condition is detected, cycle is repeated over and over again up to 10 times maximum.

If machine re-starts successfully, all alarm counters are reset after some minutes of regular operation. After 10 alarm conditions triggered by the same cause, the machine goes into fault lock-out mode, a lock-out mode warning appears on the display and the **FAULT** led turns on.

The alarm is generated in theese cases:

- **Digital Input Stream Absence.**
  Waits 3 Seconds. After 10 attempts, it not generates **FAULT** condition.
- **Overtemperature protection.**
  Waits 3 Seconds. After 10 attempts, it not generates **FAULT** condition.
- **Hardware protection of internal forward power .**
  Waits 10 Minutes. After 10 attempts, it generates **FAULT** condition.
- **Hardware protection of internal reflected power .**
  Waits 10 Minutes. After 10 attempts, it generates **FAULT** condition.
- **Hardware protection of external forward power .**
  Waits 10 Minutes. After 10 attempts, it generates **FAULT** condition.
- **Hardware protection of external reflected power .**
  Waits 10 Minutes. After 10 attempts, it generates **FAULT** condition.

WARNING Condition:

This condition not inhibit the ouput power of transmitter and are signalled through the **WARNING led** turns on (see fig. 9.1 - item [2]), through Graphic User Interface, through TC/TS (see chap. 9.3.2) and TELECON.

The alarm is generated in theese cases:

- **Software protection of modulator out of control.**
- **Software protection of modulator with HW/SW internal problems.**
- **Software protection of ALC out of limits alert.**

FAULT Condition:

This condition is generated after 10 **WAIT** conditions triggered by the same cause, the machine goes into fault lock-out mode, and is signalled through the **FAULT** led turns on (see fig. 9.1 - item [2]), through Graphic User Interface, through TC/TS (see chap. 9.3.2) and TELECON.

From this condition, the restore of normal operation is possible only from the user from Graphic User Interface, from TC/TS (see chap. 9.3.2) or from TELECON.

6.2.12 General Settings

This menu provides the general setting for the exciter.

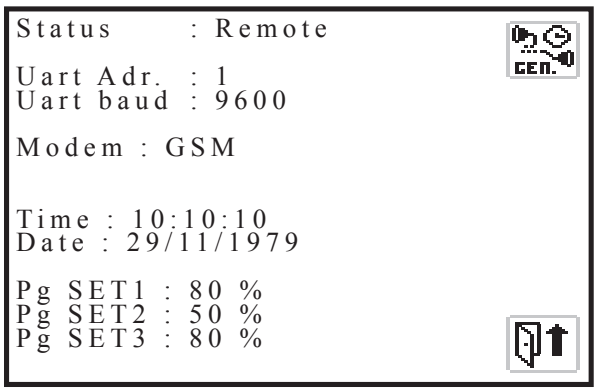


Figure 6.20

`Status` Selection of the working mode (Local or Remote).

`Uart.Adr` Selection of the address for I2C and serial communications, selectable from 1 to 200.

`Uart.baud` Selection of the baud rate for the serial port data transfer, selectable between 1200, 2400, 4800, 9600, 19200 and 38400.

`Modem` Selection of the modem modality. The status can be displayed “Present” (traditional PSTN modem function enabled), “GSM” (GSM modem function enabled) or “Absent” (modem function disabled).

`Time` Selection of the time expressed as HH:mm.

`Date` Selection of the date expressed as dd/MM/yy.

`Pg SET1` Selection of the power good 1 on internal forward power. The adjustment of the level is available in step of 1 % from 0 (power good disabled) to 99 %.

`Pg SET2` Selection of the power good 2 on internal forward power. The adjustment of the level is available in step of 1 % from 0 (power good disabled) to 99 %.

`Pg SET3` Selection of the power good 3 on internal reflected power. The adjustment of the level is available in step of 1 % from 0 (power good disabled) to 99 %.

`Exit` Press to return on submenu selection.

6.2.13 TCP/IP Option set

This menu provides the Local Area Network parameters setting for the exciter (only if the option is present).

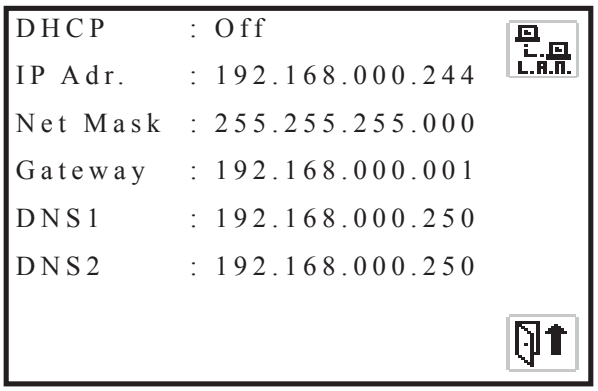


Figure 6.21

DHCP	Selection of the Dynamic Host Configuration Protocol.
IP Adr.	Selection of the IP address.
Net Mask	Selection of the Network Mask.
Gateway	Selection of the default gateway.
DNS1	Selection of the IP Domain Name System server 1 address.
DNS2	Selection of the IP Domain Name System server 2 address.
Exit	Press to return on submenu selection.

6.2.14 GPS Option Status

This menu provides the Global Positioning System parameters setting for the exciter (only if the option is present).

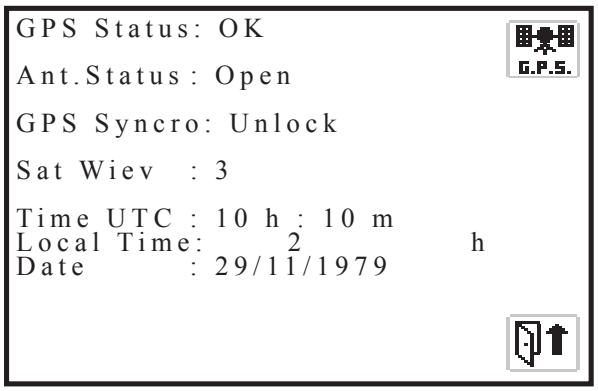


Figure 6.22

`GPS Status` Visualization of the GPS status.

`Ant. Status`
Visualization of the Antenna Status.

`GPS Syncro` Visualization of synchronization status with satellites.

`Sat View` Visualization of the number of satellites received.

`Time UTC` Visualization of the time from Universal Time Clock received.

`Local Time` Selection of the offset on Universal Time Clock received.

`Date` Visualization of the date from Universal Time Clock received.

`Exit` Press to return on submenu selection.

6.2.15 Modem Informations

This menu provides the modem setting for the exciter.

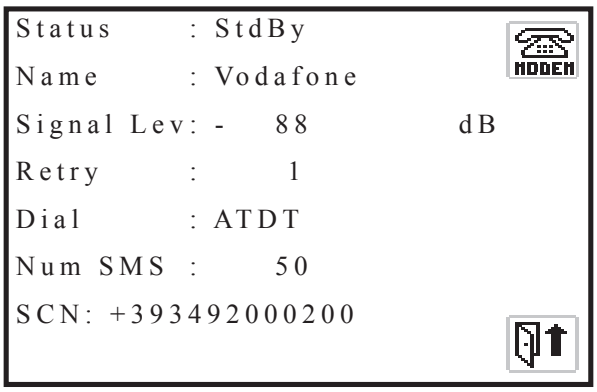


Figure 6.23

`Status` Visualization of the modem activity status.

`Name` Visualization of the name of phone operator.

`Signal lev` Visualization of the GSM signal level received expressend in dB.

`Retry` Visualization of the alarm SMS number to send.

`Dial` Visualization of the time from Universal Time Clock received.

`Num SMS` Selection of the offset on Universal Time Clock received.

`SCN` Visualization of the number of SMS alerts to be sent.

`Exit` Press to return on submenu selection.

6.2.16 Informations

This menu provides the information on the software version and jumper setting for the exciter.

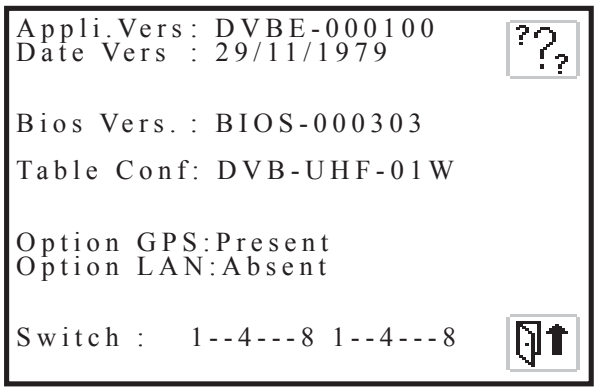


Figure 6.24

`Appli.Vers` Visualization of the application release code.

`Date Vers` Visualization of the application release date.

`Bios Vers.` Visualization of the bios release code.

`Table Conf` Visualization of the configuration table code.

`Option GPS` Selection of the offset on Universal Time Clock received.

`Option LAN` Visualization of the number of SMS alerts to be sent.

`Switch` Visualization of the dip-switches configuration status.

`Exit` Press to return on submenu selection.

7. Technical specifications

General

Standards available	DVB-T, DVB-H, DVB-SH, ATSC-8VSB
Frequency range	UHF bandwidth (470-862 MHz)
Cooling	Forced air (with variable speed according to temperature)
RF output connector	N female
Impedance	50 Ohm
Load mismatch	2:1 Max
RF monitor connector	BNC (50 Ohm)
Nominal Power DVB	1Wrms (Class A) 50Wrms (Class A/B)
Nominal Power 8VSB	4Wrms (Class A) 70Wrms (Class A/B)
Shoulder at F0+-4.2MHz	<-36dB

Digital modulation DVB-T/H

IFFT	2K, 4K and 8K
Guard Interval	¼,1/8,1/16,1/32
Code Rate	½,2/3,3/4,5/6,7/8
Modulation	OFDM
OFDM Carrier	QPSK, 16QAM, 64QAM
Hierarchical parameter	alpha=1,2,4
Offset	1Hz
SFN	Integrated
Network delay compensation	
Bandwidth	5,6,7,8Mhz
MER	> 36dB for each Power
Spectrum inversion	supported

Digital modulation DVB-SH (only multicarier) AGMTS-AMB-ICD-004 v1.5

IFFT	1K,2K,4K and 8K
Guad Interval	¼,1/8,1/16,1/32
Code Rate	1/5(std), 2/9(std), ¼(std), 2/7(std), 1/3(std), 1/3(comp), 2/5(std), 2/5(comp), ½(std) ½(comp), 2/3(std), 2/3(comp)
Modulation	OFDM
OFDM Carrier	QPSK, 16QAM
Time Interleave	Adjustable
No Hierarchical	
Offset	1Hz
SFN	Integrated
Network delay compensation	
Bandwith	1,7,5,6,7,8Mhz
MER	> 36dB for each power

Digital modulation ATSC-8VSB (standard A/53, A/54, A/64)

Modulation	8VSB
Offset	1Hz
Bandwith	6Mhz
MER/SNR	> 30dB for each power

Mechanical Features

Dimensions	
Weight	
Operation temperature	from -10°C to +45°C
Storage temperature	from -20°C to +85°C
Max humidity	90%, non condensing

8. Functional Description

This chapter contains the information necessary in order to install and use the machine.

8.1 RF Configurations

8.1.1 Introduction

The DTVP RF configurations are 1Wrms, 50Wrms in case of DVB modulation and 4Wrms, 70Wrms in case of 8VSB modulation. For greater power is possible to connect an external amplifier.

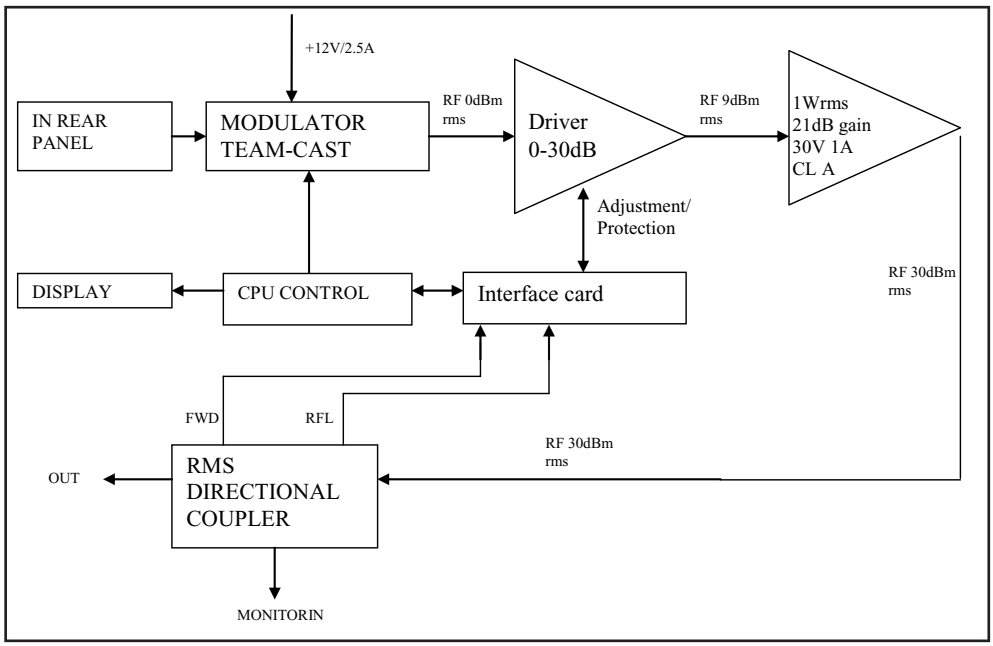
In the case of 1Wrms/4Wrms the PA is class A and provides high linearity. It has excellent MER values even without the precorrector inserted. The 50Wrms/ 70Wrms class A/B PA or a higher power end point can be added in tandem to the 1Wrms/4Wrms PA.

The power reading is carried out by a directional coupler thru rms with excellent performance

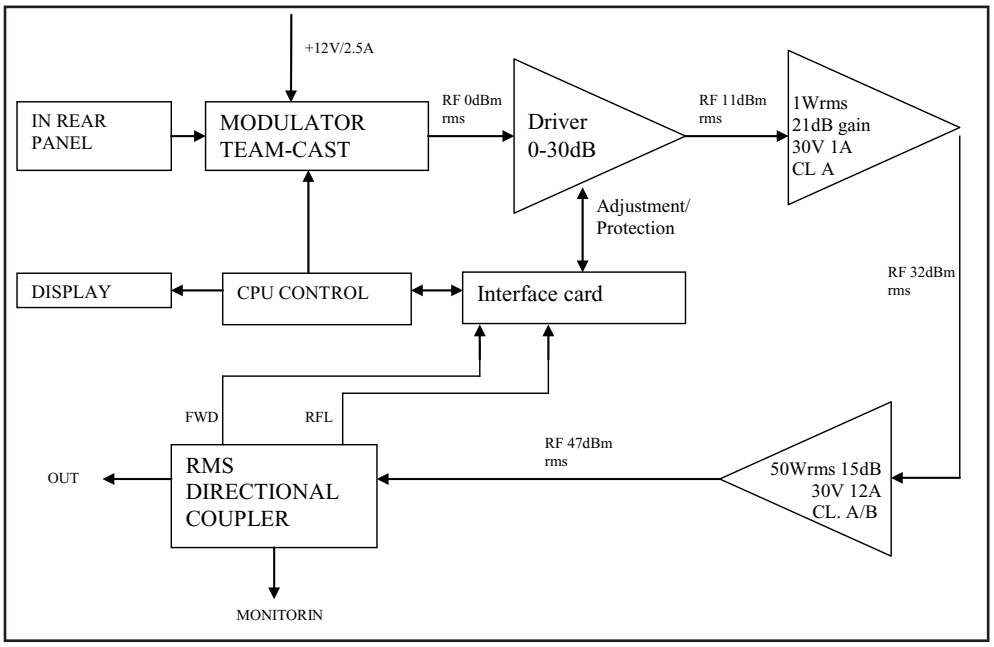
in terms of linearity and precision.

The driver module is used for regulating the final output power and in order protect the following ends through timely attenuation of the output power level by 40dB.

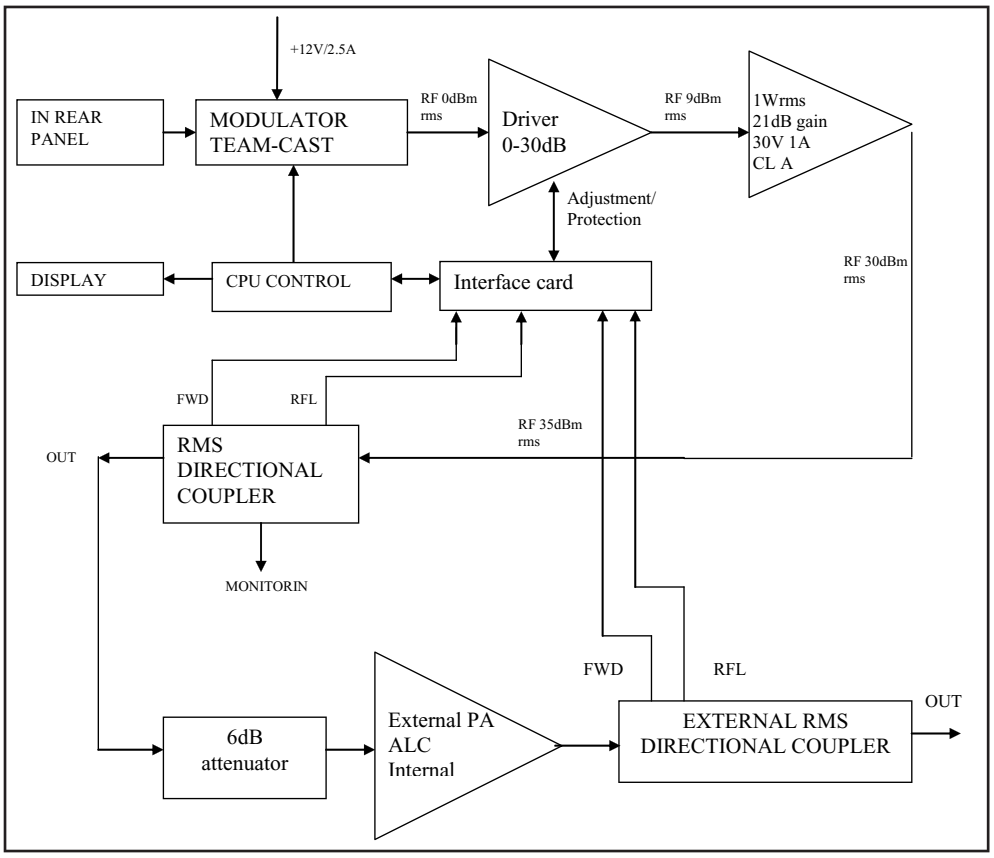
8.1.2 1Wrms/4Wrms



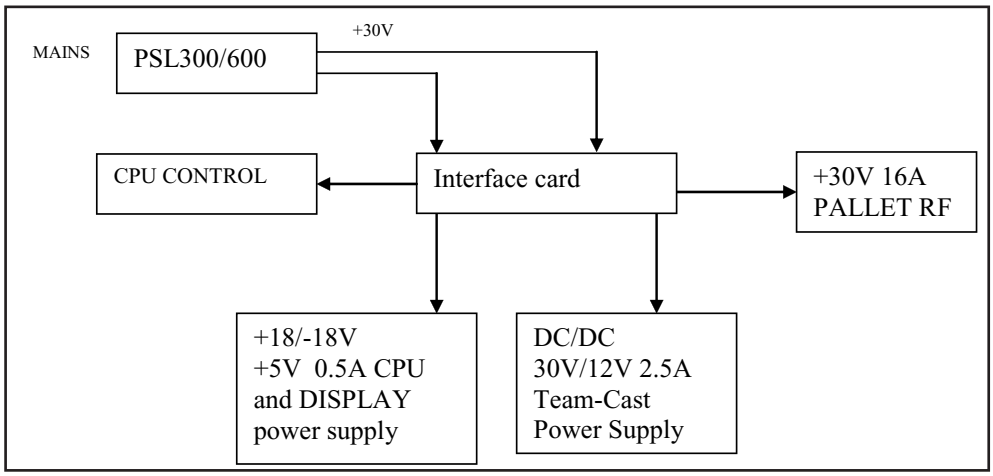
8.1.3 50Wrms/70Wrms



8.1.4 With external amplifier



8.2 Electrical power section



The power supply is connected directly to the interface card, which collects and distributes all the various voltage levels within the machine.

8.3 Cooling system

The machine is equipped with a high performance fan. The air flow is variable and depends on the temperature of the PA. It is controlled by the interface card, which measures the temperature on the PA and regulates the rotation speed of the fan accordingly.

8.4 Power Supply

The power supply is configured so that it can be easily replaced.
It supports mains at 230Vac/50Hz and 115Vac/60Hz. It is short-circuit protected.

8.5 CPU

The SL034CP1001 card is defined as a microprocessor card that hosts the firmware necessary for the following functions:

- User interface (display, 8 LED panel)
- IIC Slave Bus
- RS232 Bus with Modem and USB support
- Interface card I/O (Relay and analogue)
- MODULATOR block interface
- System Bus interface
- Option Management

8.6 Modulator

This appears as a block connected to the CPU via a dedicated connection. The CPU continuously checks the status of the modulator and the connection. In the case of a fault it signals the event and tries to reset the machine if possible.

8.7 Interface Card

The interface card performs the following functions:

- Quick measurements and protections on direct and reflected power.
- Regulation of output power.
- Supplying the Modulator
- Measuring currents at the PA
- Providing a telemetry and telecontrol interface
- Controlling speed of the fan depending on the temperature of PA

8.7.1 Quick measurements and protections on FWD and RFL power

The protection functions intervene in the case of high reflected and/or direct power. They act on the driver by removing the RF signal. They intervene very quickly since they are implemented through an analogue network. This then notifies the CPU of the protection that has intervened signalling the event with a message.

The measurement of the direct and reflected power is obtained via the internal/ external directional coupler.

These same measurements are also reported on the external telemetry connector.

8.7.2 Regulation of the output power

The level of the output power is varied by means of the control signal on the driver. Every time there is a variation in power or a change of channel the machine performs a softstart that sets the output to the defined value. The ALC can be inserted or uninserted to keep the output power constant. This function, controlled via software, is implemented by means of an electronic trimmer.

There is no need to perform calibration at each channel change since all compensations have been tabulated in the CPU.

Additional hardware protections have also been implemented in case the CPU loses control of the machine status.

8.7.3 Measuring current at the PA

A DC/DC switching power supply is implemented to power the modulator block.

8.7.4 Measuring current at the PA

The currents absorbed by the PA 1-4W plus the driver are at most 2A and 15A for the 50-70W PA.

These measurements are read by the CPU and generate an alarm if maximum values are exceeded.

The sum of both is present on the telemetry connector.

8.7.5 Telemetry and telecontrol interface

The telemetry and telecontrol signals are available on a DB25 connector on the back of the machine. The layout is standard RVR.

The following are the **telemetry** signals

Pin 1	TRFLI internal reflected power
Pin 19	TFWDI internal passing power
Pin 4	TRFL external reflected power
Pin 16	TFWD external passing power
Pin 2	Voltage on the TVPA PA
Pin 14	Temperature of the TTEMP PA
Pin 15	Total current absorbed by the TIPA PA

The following are the **telecontrol** signals:

Pin 8	TC-ON switch-on
Pin 20	TC-OFF switch-off
Pin 11	TC-RESET reset
Pin 13	TC-INTLK Interlock

The following are the **telenotification** signals:

Pin 5	TS-INTLK Interlock Active
Pin 10	TS-WAIT Machine Waiting
Pin 12	TS-OFF Machine OFF
Pin 25	TS-ON Machine ON
Pin 17	TS-FAULT Machine in fault
Pin 23	TS-LOCAL Machine Local
Pin 9	TS-SET1 Signal available
Pin 22	TS-SET2 Signal available
Pin 18	TS-SET3 Signal available
Pin 6	TS-SET4 Signal available

The following are the **Vout** pins:

Pin 3,7,21	GND
Pin 24	+Vout

8.7.6 Telemetry and telecontrol interface

Temperature sensor and fan are connected directly on the interface card. Automatic control takes place by means of hardware through a special analogue controller. This is set so that the revolutions of the fan are highest at 100°C.

9. External description

This chapter includes the elements of the front and rear panels and a short description of **DTVP** for DVB-SH & DVB-H standards.

9.1 Front panel

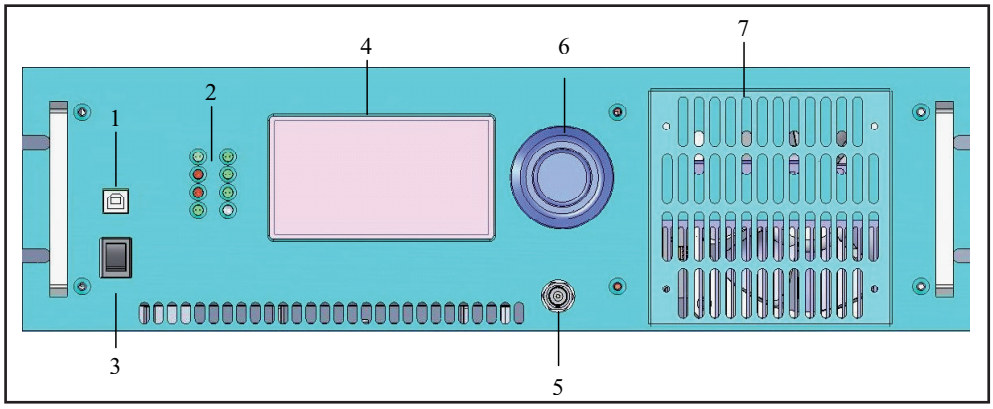


Figure 9.1

[1]	USB	For programming firmware and setting the modulator parameters
[2]	LED	For signalling status and alarms: **RF**: Green LED, it is lit on when the exciter is switched on. **LOCK**: Green LED, it is lit on when the PLL is locked to working frequency. **ASI**: Green LED, it is lit on when data streams are present on ASI inputs. **LOCAL**: Yellow LED, it is lit on when the exciter is set in Local status. In case the LED flashing, it indicates communications ahead between exciter and TELECON software. **WAIT**: Yellow LED, it is lit on when the exciter is temporary freeze conditions. **WARNING**: Yellow LED, it is lit on in presence of transmitter failure that not stop the working functioning (for example communicaton lack between the modules). **FAULT**: Red LED, it is lit-on in presence of transmitter failure in case of hardware alarms (for example the breaking of modules). In case the LED flashing, it indicates the temperature alarm. **INTERLOCK**: Red LED, it is lit on when exciter is not delivering power because inhibited by an interlock signal.
[3]	POWER	ON/OFF switch
[4]	DISPLAY	LCD graphical display
[5]	RF MONITOR	BNC connector for RF test
[6]	ENCODER	Knob and button for controlling the software
[7]	AIR FLOW	Grid for passing the ventilation air

9.2 Rear panel

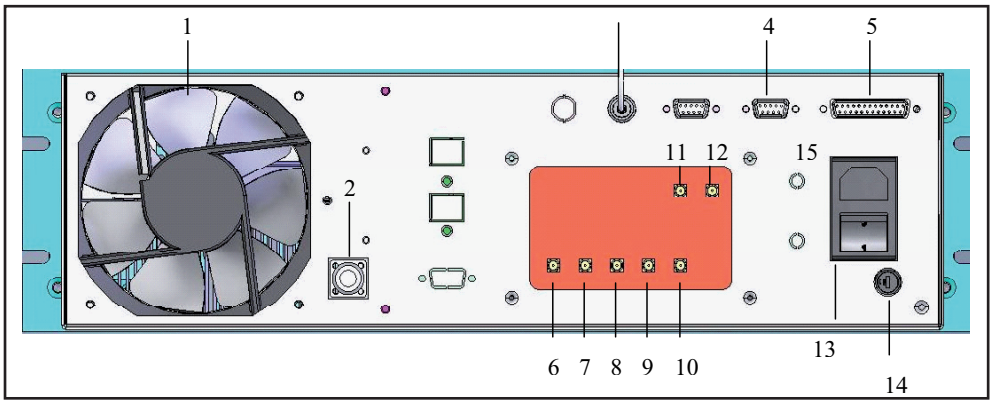


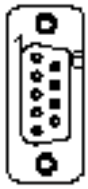
Figure 9.2

[1]	AIR FLOW	Grid for passing the ventilation air
[2]	R.F. OUT	N connector for output power
[3]	INTERLOCK IN	Interlock input BNC. The exciter is forced into stand-by when grounded.
[4]	RS232	DB9 for programming firmware and setting the modulator parameters
[5]	TELEMETRY	DB25 for telecontrol and telemetry
[6]	ASI1	ASI1 digital input
[7]	ASI2	ASI2 digital input
[8]	GPS	GPS input
[9]	1PPS IN	1PPS reference input
[10]	NC	Not Connected
[11]	10MHZ OUT	10MHz reference output
[12]	10MHZ IN	10MHz reference input
[13]	POWER	ON/OFF switch
[14]	MAIN FUSE	Fuse for mains voltage
[15]	MAINS	Standard IEC connector for the network. 110-230V +10/-15%

9.3 Connectors

9.3.1 RS232

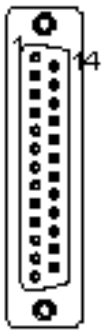
Type: Female DB9



1	NC
2	TX_D
3	RX_D
4	Internally connected to 6
5	GND
6	Internally connected to 4
7	Internally connected to 8
8	Internally connected to 7
9	NC

9.3.2 Telemetry

Type: Female DB9



1	TRFLI Internal Reflected Power Measurement
2	Voltage Measurement on the TVPA PA
3	GND
4	TRFL External Reflected Power Measurement
5	TS-INTLK Interlock Active Signalling
6	TS-SET4 Signal available signalling
7	GND
8	TC-ON switch-on control
9	TS-SET1 Available Signalling
10	TS-WAIT Machine Waiting Signalling
11	TC-RESET reset control
12	Machine OFF signalling
13	TC-INTLK Interlock control
14	TTEMP PA Temperature Measurement
15	Measurement of Total Current absorbed by the TIPA PA
16	TFWD external direct power measurement
17	TS-FAULT Machine in Fault signalling
18	TS-SET3 Available Signalling
19	TFWDI Internal direct power measurement
20	TC-ON switch-off control
21	GND
22	TS-SET2 Available Signalling
23	TS-LOCAL Machine Local signalling
24	+VOUT
25	TS-FAULT Machine in Fault signalling

10. System Status Enquiries

10.1 Remote alarm monitoring

Locally, DTVP provides status indications through the front panel lights, whereas more detailed information is available in the setup and configuration menu.

10.2 Remote enquiries using remote control software (Opt.)

Using a PC with the “TELECON” telemetry and remote control software installed, the user can get an accurate picture of all system operating parameters and all device settings (including connected equipments).

10.3 Remote control (Opt.)

Thanks to this system, equipments can be enqueried using a common GSM phone; possible equipment responses are listed in the tables included in the following paragraphs.

Before enquiring the system using SMS messages, establish a connection using the “TELECON” programme and set the provider service centre number and the telephone numbers authorized to send these commands to the equipments.

10.3.1 List of supported commands that can be sent via SMS

- These commands can be sent to the DTVP:

COMANDO	RISPOSTA
INFO	Station Name: (string 16char max) Station ID: (to 000 from 999) Pwr: (ON/OFF) CH: (Channel Name) Freq: (Exciter frequency in MHz), Freq: (Exciter frequency in kHz), Freq: (Exciter frequency in Hz), FWD Power: (Exciter Power in W or mW), RFL Power: (Exciter Power in W or mW), ExFWD Power: (Ext.PA Power in W), ExRFL Power: (Ext.PA Power in W), Alm ASI: (ASI alarm Present,Absent), Alm Mains: (Mains alarm Present,Absent),
INSTREAM	Station Name: (string 16char max) Station ID: (to 000 from 999) – ASI: (Asi status Present,Absent) Input ASI: (ASI1/ASI2), Syncro.: (MFN/SFN), Sts 10MHz: (Present,Absent) Sts PPS: (Present,Absent)
TXON	Station Name: (string 16char max) Station ID: (to 000 from 999) - Tx is ON.
TXOFF	Station Name: (string 16char max) Station ID: (to 000 from 999) - Tx is OFF.
ALARM	Station Name: (string 16char max) Station ID: (to 000 from 999) - Alarm: (Last 3 alarm list store in memory).
RESET	Station Name: (string 16char max) Station ID: (to 000 from 999) - RESET stored Record.
RESMOD	No repons
STATUS	Resend alarm message.
VERSION	Station Name: (string 16char max) Station ID: (to 000 from 999) - *Release App, Release Bios, Release Pann, Table Code.*
RVRSPC	Station Name: (string 16char max) Station ID: (to 000 from 999) - *Sting in a RVR reserved memory*
USRSPC	Station Name: (string 16char max) Station ID: (to 000 from 999) - *Sting in a CUSTOMER reserved memory*

Table 10.1

In case that the phone numbers programming and the numbers of connected possibilities via Telecon are not admit that a particular user can send a command, you will always have the following response: “Not Possible for this NUMBER”.

In case that the equipment is in LOCAL mode and you try to send a command, you will always the following response: “Not Possible in LOCAL state”

In case that the equipment doesn’t recognize a command, you will always have the following response: “Command not available”.

Note: Response time to SMS commands may vary with different GSM network providers; as a general rule, response time should not exceed 7-10 minutes maximum.

11. Remote Alarm Reporting and Control (Opt.)

The Remote Alarm Reporting and Control service is activated when the DTVP is supplied in one of the following configurations:

The telemetry option supports:

- External GSM modem.

11.1 Preparation

When you subscribe to a provider service, the operator issues a SIM card that contains all subscription details, such as PIN, any optional services available and so on.

WARNING: The SIM card and its contacts are easily damaged if scratched or bent. Handle the SIM card with care when inserting or removing it.

The SIM card to be inserted into the modem must be registered for Data & Fax Service (see facsimile contract shown below).

SIM card configuration for DATA/FAX reception must meet the following specifications:
- Asynchronous; - Transparent; - 9600 Baud.

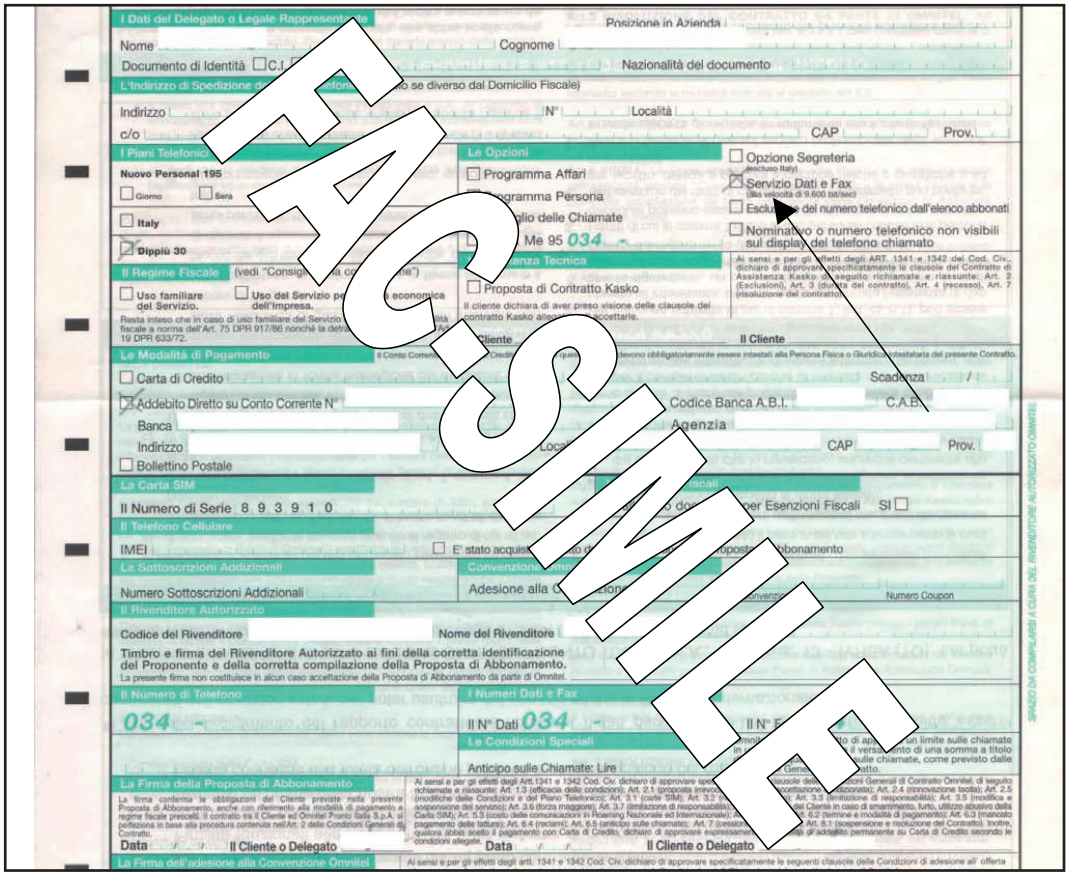


Fig.11.1: Subscription of Contract with Data/Fax option

WARNING: Some SIM cards are preset to request the PIN code as a security protection feature; this will cause a Modem malfunction. Be sure to disable this security protection using a common cell phone.

11.2 Remote alarm reporting configuration

Firstly, you will have to set certain parameters in the (internal or external) telemetry option using the “TELECON” software. Connect the PC serial port COM to the RS232 connector on the rear panel of the option using a standard Male DB9 - Female DB9 serial cable.

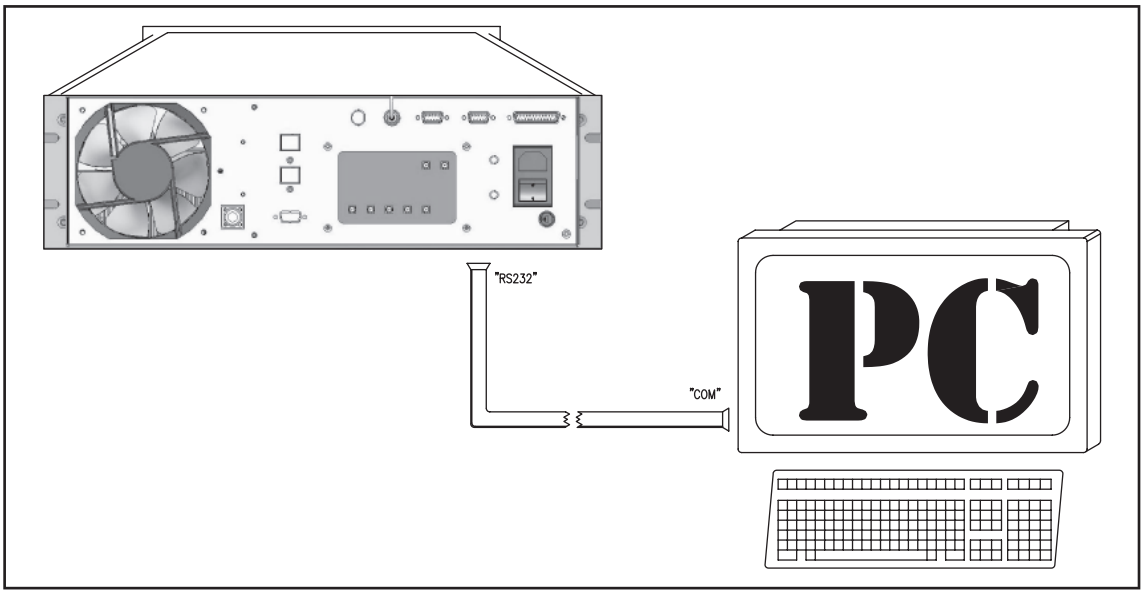
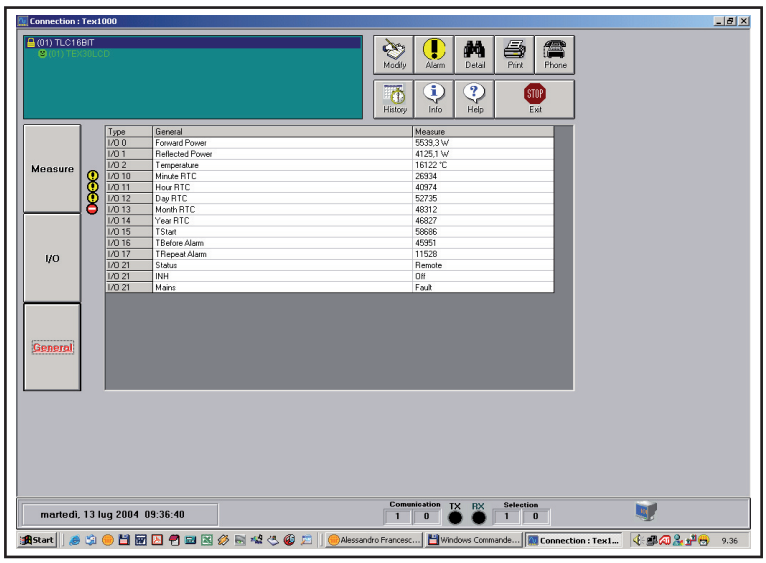


Fig.11.2: Example of connection between DTVP unit with the option and PC

When using the “TELECON” software for the first time, select the station and then enter:

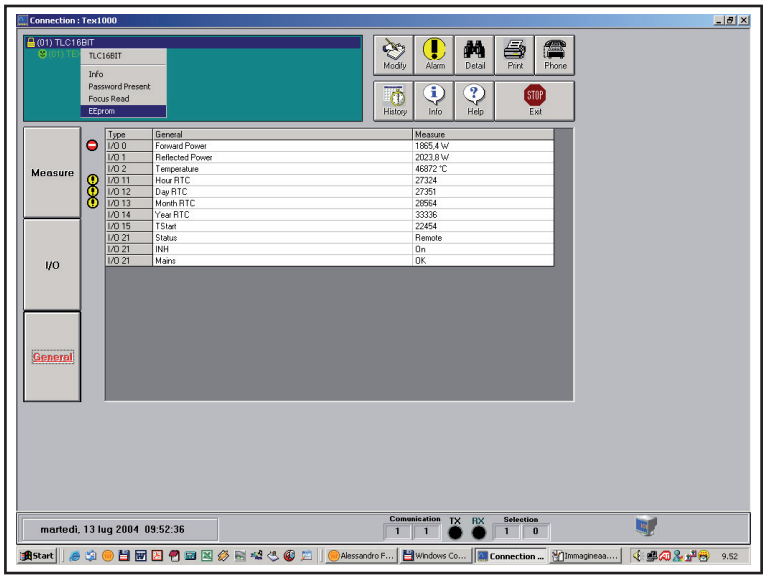
- COM port used,
- Baud rate (set to 9600),
- type of connection (set to direct, via cable).

When you have entered the correct data, click the “Start” button to confirm and the “TELECON” main screen appears, as shown in the figure:



Use this screen to change Start time. To edit this parameter, click the “TStart” box with the left mouse button (default setting is 300sec., the equivalent of 5 min.); this opens a window where you can change the setting. Press Enter to confirm.

Double click the green label in the top left corner of the TELECON screen and select “Eeprom” (as shown in the figure below).



In the open menu, press this key to view station parameters.

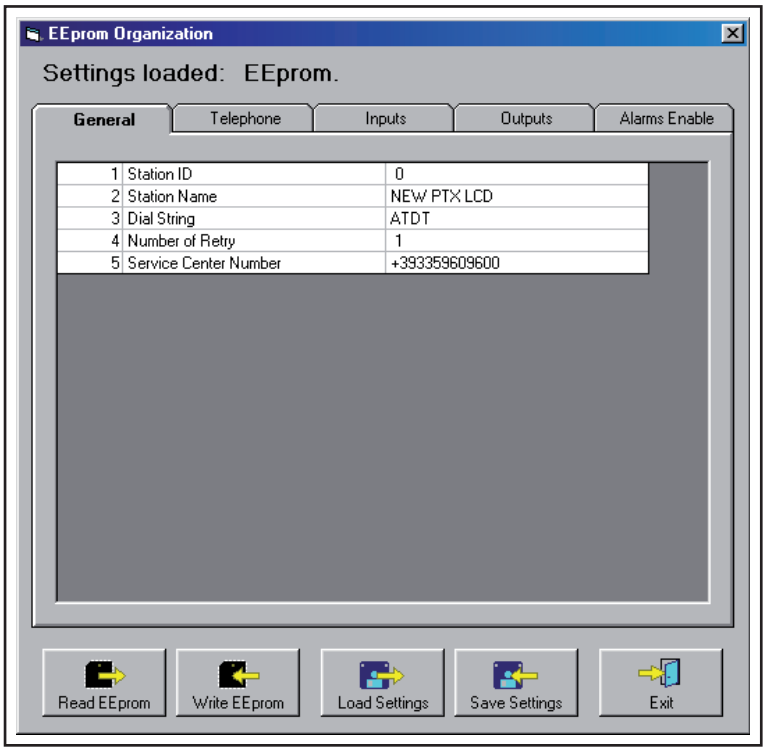
- Select the “General” data category and set the 5 parameters:
- **STATION ID:** Station identifier;
- **STATION NAME:** (max 18 characters);
- **DIAL STRING:** required setting for a GSM modem is ATDT;
- **NUMBER OF RETRY:** number of alarm transmission repetitions;
- **SERVICE CENTER NUMBER:** number of GSM provider service centre for SMS transmission and reception; place country code before number.

Example with Italian service providers:

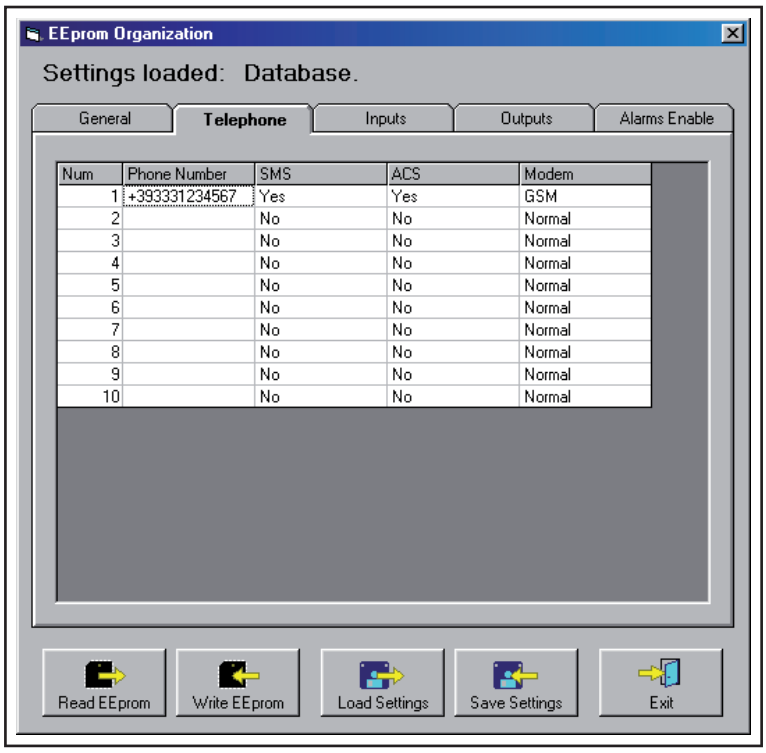
TIM: +393359609600

VODAFONE: +393492000200

WIND: +393205858500



Now select the “Telephone” data category and set the following:



- PHONE NUMBER: GSM phone numbers recognised by the station to which you want the alarms sent;
- SMS: select “YES” to enable transmission of SMS commands to system;
- ACS: select “YES” to enable SMS reception.

Note: For correct transmission, place country code (+XX) before set numbers (Use +39 for Italy).

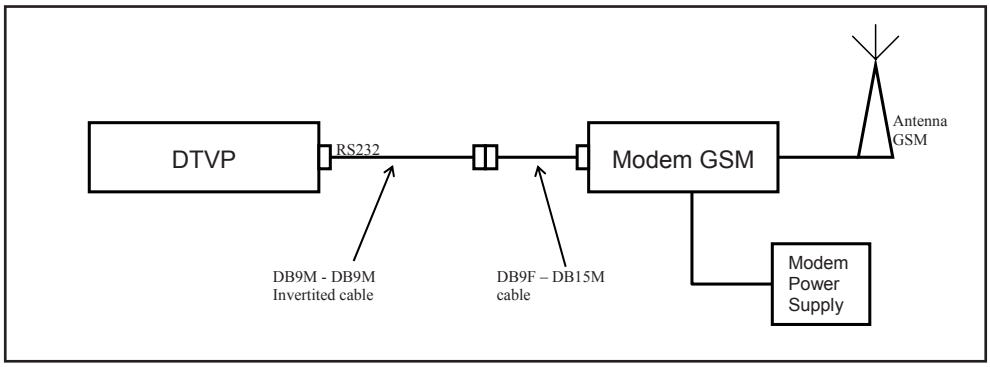
When all parameters are set, press this key and the internal or external Telemetry option will store the information.

When finished, click “Exit” to exit the remote station programming window.

Back into “TELECON” standard interface, click the “General” measurement selection button to set thresholds and operation times for the various alarms according to the principles outlined in Section “Alarm Management”.

Note: When setting alarm thresholds, allow a margin of some percent points with respect to normal operation parameters.

Note: When the configurations are completed, do not forget to connect the GSM modem to the DTVP using the supplied cables; the following block diagram and picture are for your reference:



11.3 Remote control

The “TELECON” software establishes connection with the station through a phone line and enables the following remote operations: alarm reset, transmitter power on/power off, power supply reduction, dummy load testing, etc., data evaluation to locate possible faults, identification of parts required for repair.

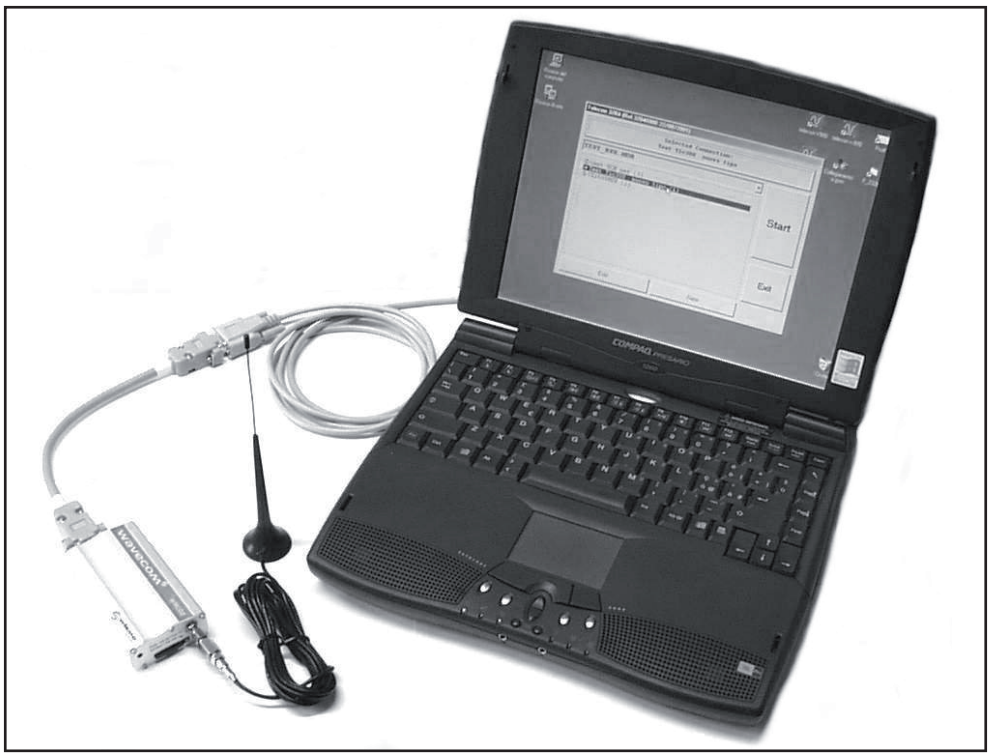


Fig.12.2: Example of Modem-to-PC connection

An alternative remote controlling option uses SMS messaging through a common GSM phone, in which case the equipment will respond as indicated in table 10.1.

Before querying the system using SMS messages, establish a connection using the “TELECON” software and set the provider service centre number and the telephone numbers authorised to send these commands to the devices.

12. Abbreviations

ALC	Automatic Level Control
ASI	Asynchronous Serial Interface
DHCP	Dynamic Host Configuration Protocol.
DNS	Domain Name System
DVB	Digital Video Broadcasting
DVB-H	DVB Handheld Systems
DVB-SH	DVB Satellite to Handheld Systems
FEC	Forward Error Correction
EXT	EXTernal
FFT	Fast Fourier Transform
GPS	Global Positioning System
INT	INTernal
HP	High Priority
IP	Internet Protocol
LP	Low Priority
MIP	Mega-frame Initialization Packet
MFN	Multi Frequency Network
MPE	MultiProtocol Encapsulation
NIT	Network Information Table
PCR	Program Clock reference
RF	Radio Frequency
RX	Receiver
SHIP	SH Initialization Packet
SYNC	SYNChronization
SFN	Single Frequency Network
QAM	Quadrature Amplitude Modulation
QPSK	Quaternary Phase Shift Keying
TI	Time Interleaving
TPS	Transmission Parameter Signalling
TV	TeleVision
TX	Transmitter
UHF	Ultra-High Frequency
UTC	Universal Time Clock
VHF	Very-High Frequency